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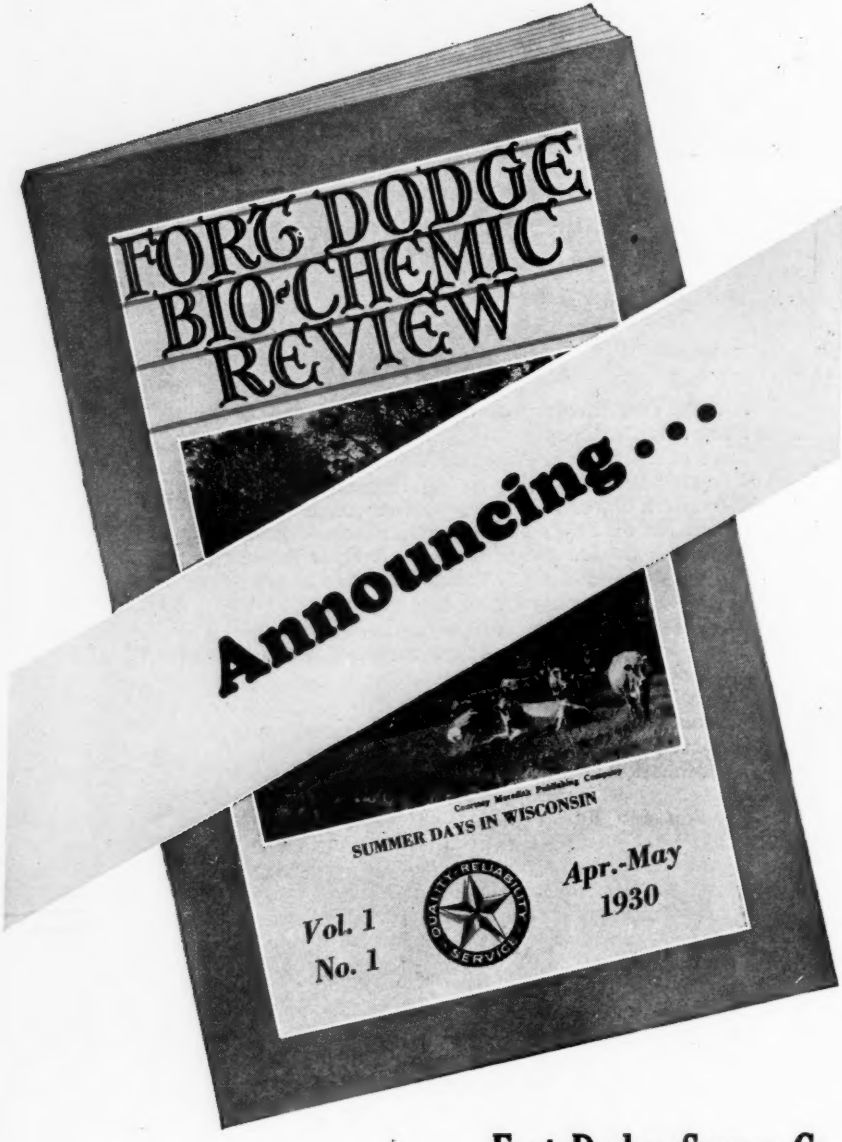

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D. M. Campbell, Editor A. T. Kinsley, Associate Editor

The proper ratio of sodium to calcium is necessary for the normal functioning of all body cells, especially the nerves.

Iodin is used in building the important products produced by the thyroid gland, which controls the growth and rate of metabolism in the body.

Of 955 dairy cows in various parts of the state of Idaho that were tested by the agglutination test for abortion disease, 213 or approximately 23% reacted positively.

Phosphorus is essential to every cell nucleus, forms part of the most important substances which make up the nerves and must be present in the tissues in order that sugar may be utilized.

Sodium chlorate is one of the chemicals that has been recommended for use in the control of weeds. Three ounces of sodium chlorate or calcium chlorate given in two equal doses four hours apart has been found sufficiently toxic to kill 100-pound wethers.

Some poultry men claim the ravages incident to white diarrhea can be diminished by keeping the chicks in darkness for the first three or four days excepting during feeding time. This is contrary to the belief that light and especially sunshine is beneficial to chicks under all conditions.

For the growing child there is no food ordinarily used that can be considered as good a source of calcium as is milk.

Calcium is needed not only for the normal development of bones and teeth, but for normal cellular control. Where it is lacking, nerve disorders quickly follow.

Parrot mouth (prognathism) is relatively common in lambs. This condition has been noted to occur in certain families and is known to be an inherited defect.

Autopsy records on poultry specimens submitted for diagnosis to the Idaho Experiment Station, show over fifty per cent of the infections or infestations were soil-borne.

Some outbreaks of roup, fowl cholera and fowl typhoid have been traced directly to infection spread by recently acquired birds. Such outbreaks can usually be prevented by effectual quarantine of recently acquired birds for a period of fifteen days.

"Pullets from 2½ to 5½ months of age may be successfully immunized to fowl pox. Vaccinated birds in which the disease was not previously present, do not appear to transmit pox to susceptible birds four months after vaccination." Circular No. 30, N. H. Agr. Exp. Sta.

The individual hog house, when properly made and used, has made itself indispensable to successful hog raising. It is adaptable to varied conditions which cannot be met by centralized hog houses.

Prices of horses have been on the upward trend for three years. The average cycle of horse prices is about 25 years in length, meaning an average of about 12 years between the peak of high prices and low prices.—*Successful Farming.*

A survey made by the Department of Agriculture in Indiana, Iowa and Illinois showed that 35.8 per cent of the pigs farrowed in the spring and 24.2 per cent farrowed in the fall were lost before weaning.

Meat production is falling behind national consumption requirements. Especially in the case of beef cattle, slaughter on a per head basis is steadily falling below that of 1929. Present indications are that when the 1930 tonnage figures are compiled, they will present convincing evidence that the long advertised beef shortage has arrived. However, the low price of dairy products may turn a whole lot of less productive cows into the beef trade.

In instituting any measures for the control of animal diseases, the people most intimately concerned in formulating the program of control are brought to a consideration of two prime factors involved—one purely economic and the other pertaining to public health. In dealing with affections which are transmitted from the animal to man, the veterinarian is in a position, through his special training, to lend his confrere in human medicine a helping hand, not only by actually reducing or eliminating entirely the sources of infection, but also through co-operating in cases where the sources of the diseases of humans are obscure and where there may be possibility of tracing the infection to animal origin.—J. R. Mohler.

DO YOUR BEST ALWAYS

After over twenty years of practice, I am thoroughly convinced that it is well worth while to always take such precautions when castrating stallions as boiling the instruments and thoroughly cleansing the scrotum with mercuric soap, and cleansing the hands at the same time.

That means casting the animal of course, but why needlessly risk life and limb in the pursuit of a vocation? In the case of mature stallions, the administration of a hypnotic—chloral hydrate—I think is good business. Where such precautions are carefully observed in all cases, the quack has a small chance to thrive.

Regina, Sask. L. L. Hewitt.

"There has been discovered in five herds of swine a heritable defect manifest in pigs at birth in the form of a brain hernia on the fore part of the skull. This is due to the failure of the skull bones to fuse in the region of the forehead, thus allowing the outer brain layers, and consequently brain fluid to escape." (An. Rep. Idaho Exp. Sta.)

Whorls according to recent investigations are decidedly heritable. The tendency for the transmission of whorls is not constant but the occurrence of this defect is sufficiently common that care should be exercised in the selection of breeding stock to eliminate any animal that shows the defect or is a close relative of an individual that was so marked.

The normal breeding season in martens according to circular 107-C issued by the U. S. Department of Agriculture occurs during the summer months, usually between the middle of July and the third week in August, and not during the winter months. The gestation period ranges from approximately 8½ to 9 months (259 to 275 days), instead of 60 to 102 days as has been heretofore generally accepted to be the case.

It may be safely predicted that the day is not far distant when the table salt now commonly used will be replaced with a mixture of salts containing the minerals needed by the body.—J. S. Hughes in *Successful Farming.*

While it is true that certain minerals are needed to build bones and teeth and to supply hemoglobin for the blood, this by no means represents the importance of minerals in nutrition. Proper amounts and proper balance of minerals are absolutely essential to the normal functioning of every cell in the body.

The opium advisory council of the League of Nations estimated that 100 tons of opium, 136 tons of morphin, 84 tons of cocain and 15 tons of heroin are required annually for legitimate medical purposes. The amount of narcotics produced is not known, but has been estimated at over 8,000 tons annually, which is more than twenty times the amount actually required for medical use.—*Science.*

The most important single factor in reducing chick mortality is to have the right kind of chicks with which to start. The next important point is to start them on what is commonly called clean ground, that is, ground which has been free from chickens of any age for at least one year and upon which no poultry manure has been spread for the same period of time.—L. E. Card in *Successful Farming.*

Iron is a normal constituent of the oxygen-carrying hemoglobin of the blood. Iodin is used in building the important products produced by the thyroid gland, which controls the growth and rate of metabolism of the body. Chlorine, which is found in ordinary table salt, is an element in building the acid in gastric juice. Phosphorus is built into the structure of the nucleus of every cell, is an integral constituent of some of the most important compounds of the nerves, and must be present for the proper burning of sugar.—J. S. Hughes in *Successful Farming.*

The intermediate host of the liver fluke of the goat is a snail. This parasite is not very destructive to goats in the United States because goats are usually maintained in the semi-arid districts.—*Angora,* Vol. 15, No. 3.

The specific toxic substance of the loco plant has not been identified, however, it is known to be cumulative and habit forming. The only definite method of avoiding loco poisoning is to prevent animals from eating the plant. These plants can be eradicated by repeatedly cutting the plant root about two inches below the soil surface.

According to recent information obtained from a rare fifteenth century volume, John Nufer, a swine gelder (veterinarian), successfully performed Caesarean section on his wife in 1500. The child was born alive, the wound healed without infection and several years later the woman gave birth to twins in the normal way.—*The Bloodless Phlebotomist,* Vol. 6, No. 1.

Baby chicks are not injured by early feeding, nor does delayed feeding seem to be harmful. Extensive experiments conducted by the United States Department of Agriculture show that under normal conditions the best practice is to feed the chicks early. However, they will not be stunted by failure to do so. Chicks shipped by parcel post probably should not be fed before being shipped.—*Successful Farming.*

The vitamin D content in milk can be increased four to eight times by feeding irradiated yeast to the cows. This discovery, which was made at the University of Wisconsin, is rather surprising when we realize that all previous attempts to increase the vitamin D content by the use of cod liver oil and other methods had failed. The possibility of improving cows' milk in this way may lead to important developments in the matter of developing milk especially rich in vitamin D for invalids, children suffering from rickets, and others. The whole problem is being given considerably more study. —*Successful Farming.*

A Preliminary Note on a Six Years' Investigation of Canine Distemper

By S. G. BILLINGTON, M.B., B.S. Long, F.R.C.C.,
and E. Leamington Spa, Warwicks, England
With Clinical Co-operation of W. Trigger, F.R.C.V.S. and H. S. Caldwell, M.R.C.V.S.

CANINE distemper is a typical example of a number of diseases commonly called the "specific fevers"—measles, whooping cough, influenza, etc. If there is an animal disease exactly analogous to a human disease, there are obviously many advantages in working on the animal disease.

For these reasons canine distemper was approached, and the following specific fever landmarks apply.—

1—The disease is always with us, showing its seasonal and cyclic variations in prevalence and virulence.

2—It is a serious disease on account of the complications liable to supervene.

3—There is a great individual variation as regards resistance to the disease. A proportion of the community is extremely susceptible, another proportion is naturally immune, while the third group behaves in an average manner to the infection.

4—Our definite knowledge as to the bacteriology of the disease is vague, and as is the case in so many other infections will remain so, until the filter passer bacterium association has been elucidated. The causal virus in many specific infections is known to be a filter passer, and at the same time, bacteria like the distemper bacillus, the Bordet bacillus in whooping cough, the hemolytic streptococcus in scarlet fever, etc., are known to be closely associated with the corresponding diseases.

5—Specific preventive and curative agents are unsatisfactory, and are likely to remain so until our knowledge of the habits of the infecting organism is more complete.

From the investigation to date, we claim to have established two points:

1—From the bacteriological aspect, there are definitely two quite distinct, self contained, stages; in the life cycle of an organism, of which the bacillus bronchisepticus is one stage.

2—A product has been evolved which consistently controls the infection, and which demonstrates that a bacterial organism, will control the virulent filter passer in the animal.

As the first point is of considerable bacteriological interest; and as there is reason to believe that the curative product will be found to be of use to the clinical veterinarian; we offer this preliminary note for publication at the present uncompleted stage of the investigation.

We shall present the note under the three headings of:

A—A Resume of the steps in the bacteriological workings, details of the steps being given in the references quoted.

B—A Resume of the clinical response to various therapeutic agents.

C—A Summarizing Commentary, correlating A and B.

A—Bacteriologically, the investigation has been confined to the blood, for the reasons that,—

1—The infecting organism is known to be present therein.

2—The blood can be obtained with a minimal risk of adventitious contamination; the absence of extraneous bacterial life in the infective exudate under scrutiny, being of paramount importance.

In many diseases, as for example trench fever, the infection can be transmitted by injecting the blood, or an insect such as the body louse will activate the blood; although blood cultures by the usual methods are all negative. These phenomena would appear to indicate the adoption of modifications of the usual methods of blood culture.

In short, this investigation is an entirely original, and unusual, method of approaching the bacteriological examination of the blood.

The steps have been as follows—

1—*Direct investigation of hemolysed red cells,* washed and in whole blood. From the red cells minute coccoid bodies were produced, and these structures are morphologically indistinguishable from filter passers, and from the minute diplococci, now being described in connection with many diseases such as scarlet fever. Emulsions of these coccoid bodies obtained from the red cells of distemper dogs, were saturated with calcium, artificially agglutinated, and used as therapeutic agents in acute distemper. In early uncomplicated distemper, they unquestionably controlled the toxemia in six to eight hours.

2—*Unusual methods of culturing the blood* were then adopted. The variations being chiefly directed towards modifications in temperature, oxygen content, reaction, and nutritional quality of the culture media. To use a common simile, "The conditions necessary to hatch out the chick, might be fundamentally different from those suitable to grow the chick after maturation." By these methods, 40 cultures taken from dogs with various types of distemper, yielded the same large bacillary organism in 36. This organism was saturated with calcium, artificially agglutinated, and used to treat distemper in various parts of Great Britain. The disease was consistently, at once controlled by it.

3—*Investigation of the large bacillary organism,* as regards its cultural peculiarities, its interchangeability with the bacillus bronchisepticus, and its capacity to fragment in certain surroundings. The last mentioned phenomenon is characterized by the gradual disintegration of the bacillary form, with the appearance of minute coccoid bodies as illustrated in accompanying microphotograph.

The large bacillary organism, tentatively called the distemper leptothrix, has been under continuous laboratory and clinical scrutiny for the last six years. Two unquestionable facts have emerged as a result.—

1—It, and the bacillus bronchisepticus, are definitely two distinct stages in the life cycle of a common organism.

2—It is definitely closely associated with the causal virus of distemper.

4—*Biochemical Investigations.* The two bacillary organisms; one of which will control the disease, and will change into morphological filter passers; the other which will do neither, were ideal for this investigation. They can be washed off agar slopes, and obtained chemically pure, free from albumen fluids, etc. It was found that a microbic or antigenic protein was common to both organisms; but that the leptothrix stage also contained a large proportion of a globulin, which was not present in the *Bacillus bronchisepticus.* The conclusion drawn from these findings was,—That the therapeutic efficacy of the leptothrix was due to the presence of the globulin element."

The investigation was then transferred to normal blood serum, since a considerable percentage of healthy mongrels have a natural immunity to distemper. With the aid of calcium bicarbonate saline, a protein complex can be separated from normal serum. This complex contains an antigenic and a globulin element, as in the case of the leptothrix organism, and probably represents the complete antibody in the serum; the antigenic element being that of the particular organism or organisms, against which the serum is immunized. The microbic antigenic element of the serum extracted complex was then split off and discarded, and the unattached calcic globulin element used as a therapeutic agent. It was found to be just as effective as any of the previously used bacterial preparations. To date, the results point to the calcic globulin being the essential therapeutic agent, and to be effective, it must either be linked up to the corresponding antigen, or it must be free. The globulin for example attached to a streptococcus, will attach itself and neutralise the same streptococcal antigen; but will

not combine with a staphylococcal antigen.

In the clinical notes to follow, a variety of therapeutic preparations have been used, from emulsions of hemolysed red cells and bacterial vaccines, to simple biochemical products: For that reason the term Inoculin has been coined, merely to indicate that the administration is *via a needle.*

The following preparations have been used:

1—Emulsions of hemolysed distemper red cells.

2—Agglutinated calcic distemper leptothrix.

3—Agglutinated calcic coccoid bodies obtained from the leptothrix.

4—Agglutinated calcic *Bacillus bronchisepticus.*

5—The calcium extracted serum complex, and there have been three variants of this.

1—The entire microbic calcic globulin compound.

2—The disintegrated compound; but with the microbic element present.

3—The disintegrated compound; but with the microbic element removed, leaving the free, unattached, calcic globulin.

CLINICAL EXPERIENCES IN THE USE OF CURATIVE DISTEMPER INOCULIN IN THE ROUTINE TREATMENT OF CANINE DISTEMPER

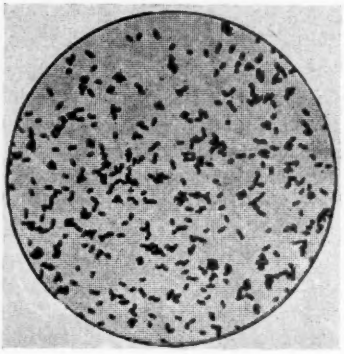
By W. T. and H. S. C.

We give in this communication a brief survey of the results of treatment of distemper cases, using the curative inoculin supplied by Dr. S. G. Billington.

One of us (W. T.) has used the various products since the earliest stages of the investigation, at the beginning of 1923; the other (H. S. C.) since the Spring of 1925. We have used the inoculin in the treatment of almost all cases of distemper and suspected distemper, as a routine method during these periods. Medical treatment has been prescribed in addition, and the usual nursing has not been neglected.

We have given inoculin in a very large number of cases, in dogs of almost all breeds in individual cases, and in enzootics among fox hounds and show dogs.

In the earlier years of the research which has yielded these products, clinical results from them varied considerably from time to time, and from one outbreak to another. Certain variations of the inoculin have been



1. The distemper baccillus.

disappointing; but during later years results have been consistent.

Owing to the widely ranging symptomatology of the disease, and the cases of doubtful diagnosis, it is difficult to formulate statistics of recoveries and failures. No useful purpose is served by a long list of individual cases and we tabulate the various clinical types as follows.—

1—Puppies showing the earliest symptoms.

2—Catarrhal distemper.

3—Advanced catarrhal cases with pneumonia.

4—Dysenteric complications.

5—Distemper with irritation of brain and spinal cord.

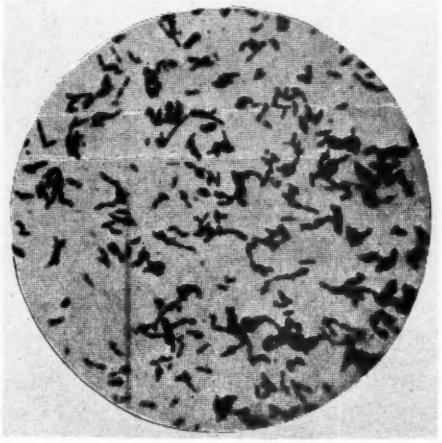
6—Exanthemic distemper.

8—Advanced acute distemper.

There are of course many cases of symptoms of more than one type, the results falling into those of the group with the most unfavorable symptoms.

We have not attempted to differentiate between pure distemper and bronchisepticus infections; but have dealt with the cases from the clinical aspect.

1—In practice, we frequently see young dogs between six and twelve months old, with anorexia of sudden onset, a frequent husky cough, and a temperature of 103-104 deg. F. without other distinctive symptoms. These are most frequently early cases



2. The distemper leptothrix.

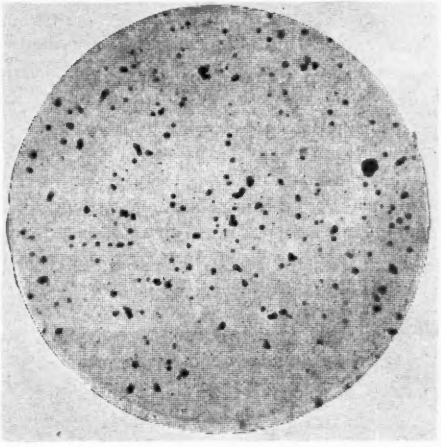
of distemper. In this group we can place susceptible dogs which are in contact with distemper patients, and are in the incubative stage. We give a dose of inoculin, 1cc to 3cc, according to the size of the dog, and the owner is advised to bring the animal the following day for a further dose. The usual precautions as to isolation and nursing are advised. In many cases we do not see the dog again, the owner reporting that there is a complete return to health. In undernourished or weakly patients, we find two or three daily doses necessary to complete the recovery. When treated in the earliest stages we find the occurrence of complications to be uncommon.

2—Typical cases of the catarrhal type of distemper in the early stages, rhinitis, conjunctivitis, without pneumonic symptoms. We give a dose of inoculin for three days daily, and then every two or three days until convalescence is complete. A simple febrifuge is given twice a day and discharges removed frequently. There is usually a progressive improvement, we have experienced a high percentage of recoveries, and find later complications such as pneumonia, and chorea, uncommon.

3—Catarrhal distemper in a more advance stage with broncho-pneumonia, etc., is frequently seen due to neglect on the part of the owner until the animal has reached this stage. In these cases we give inoculin daily, with an expectorant medicine, while warmth and good nursing are indispensable.

We find the proportion of recoveries in these cases quite encouraging, if the treatment can be carried out systematically.

4—Distemper with gastro-enteritis. In-



3. The very small diplococcal bodies as obtained from either the red blood cells, or the large bacillary organism.

oculin in the usual doses is given daily for two or three days, and then on alternative days until the dog is really well again. A preliminary purgative is given, followed by internal antiseptics, and if necessary astringents. The diet is carefully advised upon, and we get good results with this treatment; but thorough attention is necessary, to these often objectionable cases.

5—Distemper cases showing symptoms of irritation of the brain and spinal cord, such as chorea, fits, and paraplegia, do not appear to be benefitted by the inoculin treatment.

6—Exanthematical distemper. We have not had an opportunity of treating sufficient

cases to give any opinion in this type of disease.

7—Neglected cases running a chronic course do not yield readily in our experience to treatment.

8—Advanced cases of acute distemper, which have been neglected until there are pathological changes in the kidneys, lungs, bowels, and nerves, are not amenable to treatment.

We find that the results of inoculin treatment in the early stages and uncomplicated types of the disease, are very satisfactory. The course of the disease is frequently aborted, complications are not common, and undesirable sequelae, such as chorea are rare. In the more severe types of distemper cases we believe that this treatment is helpful, and the number of recoveries is encouraging. There is no object in wasting inoculin on dogs which show extensive damage to vital organs.

Reaction—We have noted in a number of dogs symptoms of what we consider to be reaction to the inoculin. Some hours after the injection the dog becomes, in these instances, listless, breathing more quickly, and occasionally vomiting. These symptoms pass off in a short time.

Relapses—As a result of a number of dogs suffering relapses when recovering from distemper, we have come to the conclusion that periodic doses of inoculin must be given until the dog has quite recovered. We give 1cc to 2cc about every third day during convalescence. In many cases, the relapses are due to the fact that owners, noticing an improvement in the dog after one or two doses of inoculin, neglect to have the case followed through to complete recovery. Treatment may have to be recommenced in about a week; but even in such cases there is a favorable number of recoveries.

The inoculin treatment of sick dogs creates a favorable impression among owners. In many cases the results are almost spectacular, especially to those who understand the difficulties in the treatment of distemper.

effect the complicating secondary organisms;

Summary

Curative distemper inoculin gives very good results in selected favorable cases; and is useful in the routine treatment of distemper and allied infections in dogs as met with in practice.

It has very slight prophylactic value.

Advantages—

1—Average good results.

2—Rarity of undesirable sequelae, e.g. chorea.

3—Adaptability to routine use.

4—Favorable effect on client.

Disadvantages—

1—Necessity for frequent dosage.

2—Risk of relapse if discontinued before complete recovery.

3—Non-response of some types.

CORRELATION OF THE BACTERIOLOGICAL AND CLINICAL STUDIES

What is the practicing clinician called upon to treat?

1—Simple, early, uncomplicated, distemper.

2—Complications due to super-added pneumococci, streptococci, and any of the intestinal inhabitants in the intestinal form of the disease. This point was very strikingly illustrated in the case of the 36 blood cultures previously mentioned. In more than half, the distemper leptothrix was accompanied by some other organism, staphylococci, pneumococci, and streptococci all appearing.

3—Late cases which are really moribund. These include cases in extremis and the nervous group, chorea etc., where the distemper toxin has already entered into combination with the nerve cells.

Group Three we can dismiss as incurable.

Group One will respond in 100% to a reliable specific antidote, and it was found that such an antidote could be produced from the hemolysed red cells of the distemper dog, from the distemper leptothrix; but not from the bacillus bronchisepticus.

Group Two is the difficult one to cater for. The pure distemper antidote will not

though the disease can be satisfactorily controlled if these secondary organisms are neutralized. It is not feasible to include all the possible complicating organisms in a blunderbuss vaccine, and it was for that reason that attention was directed towards normal serum; which we know contains natural polyvalent antibodies.

During the extraction of the desired constituents from normal serum as already described; until the technic has been standardised; three products were obtained.

1—The complete antibody in which the globulin was linked up with the particular antigen present in the serum. This variant as would be expected, was quite inert, though perfectly harmless.

2—The antibody was disintegrated, and split off from the globulin; but not removed from the preparation. The result was a mixture of free globulin and free antigen. The presence of this neutralized microbic protein, gave a mild foreign protein reaction as described.

3—The unattached calcic globulin, from which the antigenic element had been separated and removed. This product controls the actual distemper as effectively as any of the specific preparations, and also will include the secondary complicating organisms. This is the product responsible for the spectacular results; and when properly standardized, there should be no mortality in distemper except in the group three mentioned.

Personal views re Prophylaxis. The aim would appear to be—"To produce in the susceptible dog, conditions as in the naturally immune mongrel! In my opinion, the problem is a biochemical and endocrine one, and that is the aspect from which I am approaching it. The probability of the immunity following vaccination of a susceptible dog, being retained for a long period is not great.

In conclusion, I do not know how to express my thanks and gratitude to my clinical collaborators. During the last six years, I have supplied them with a curative distemper remedy. For a period it would be 100% effective, and then go right off. It must have been most trying, and distinctly inconvenient in the routine of practice. I am sure, however, that it has been accepted as one of the necessities of all quests for scientific knowledge; and without that clinical collaboration, the information that we now possess would not have been forthcoming.

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Acute intestinal coccidiosis in chicks usually terminates in death before any symptoms are evident. The usual form of chick intestinal coccidiosis is manifested by diminished appetite, listlessness, drooping wings, ruffled feathers, and more or less blood in the droppings.

STUDENT POPULATION OF AMERICAN VETERINARY COLLEGES FOR THE PAST ELEVEN YEARS

Compiled from Deans' Reports by O. V. Brumley, Columbus, Ohio

Name of College	1919-1920					1920-1921					1921-1922					1922-1923					1923-1924					1924-1925					1925-1926					1926-1927					1927-1928					1928-1929					1929-1930				
	a	b	c	d	f	a	b	c	d	f	a	b	c	d	f	a	b	c	d	f	a	b	c	d	f	a	b	c	d	f	a	b	c	d	f	a	b	c	d	f	a	b	c	d	f	a	b	c	d	f
Alabama	17	12	9	7	45	20	13	12	6	53	10	6	14	12	41	6	5	6	15	32	3	3	4	7	16	6	3	6	6	1	22	4	4	3	5	16	4	4	4	3	15	4	4	4	4	3	18	9	3	11	4	26	8	10	2	10	2	24
Colorado	20	12	13	20	65	20	22	20	20	82	23	13	19	16	71	17	14	12	19	2	64	10	13	12	12	1	48	6	5	14	11	36	10	10	10	12	1	43	20	9	11	11	3	49	16	19	7	9	5	64	21	21	15	5	72	27	20	23	12		82
Georgia	8	4	4		16	7	7	3	4	21	5	5	3	2	15	7	7	6	5	25	2	8	7	6	23	7	7	7	7	28	3	6	2	6	17	4	1	6	2	13	6	4	1	6	16	20	9	5	5	39	13	16	9	3	41
Iowa	36	30	25	26	107	36	34	18	23	94	29	17	18	19	6	89	25	22	15	17	79	32	24	18	16	90	27	27	17	17	1	89	35	14	26	15	90	27	25	17	36	4	109	39	32	22	10	6	113	55	37	30	20	6	149	55	55	35	29	5	179
Kansas	32	10	20	21	83	9	20	10	10	49	12	10	23	10	4	59	10	14	18	22	1	65	13	10	16	15	53	20	8	11	16	6	60	21	16	10	11	2	60	19	17	13	6	5	54	10	19	14	19	5	74	20	17	16	16	4	73	56	35	15	17	4	119
Michigan	5	7	7	8	27	1	6	4	6	17	11	5	6	6	1	29	13	10	9	7	39	5	10	11	8	34	11	7	10	10	2	40	4	7	6	11	4	32	11	5	1	11	3	31	6	7	10	4	7	34	5	4	5	12	6	36	8	10	7	8	5	48
Montreal																																																					8	5	6	3	5	5	6	38
New York	29	26	24	19	2	100	13	22	16	16	2	70	13	13	29	16	4	77	11	11	16	11	3	52	29	23	10	13	3	86	19	18	23	10	5	81	24	15	25	29	2	90	30	32	17	27	7	103	39	35	23	16	7	114	47	36	25	28	4	136	32	40	33	28		133
Ohio	23	16	25	27	1	92	19	20	20	20		79	14	13	24	25		86	19	12	16	25	4	76	13	12	23	20	6	74	7	7	23	20	2	59	17	9	7	21	1	55	25	10	12	8	4	59	49	19	16	13		96	34	27	22	15		108	37	35	30	24	4	130
Ontario	23	20	17	8		68	24	22	23	17		86	13	22	26	19		80	17	11	22	27		77	16	13	15	15		59	20	23	14	12	1	70	16	21	21	10	1	69	23	16	21	19	1	79	22	19	16	15	2	79	21	25	19	16		81
Pennsylvania	11	9	12	19	4	55	4	8	7	11		30	11	8	8	7		34	11	11	6	8	2	37	14	10	10	8	2	41	23	10	10	10	1	54	15	23	9	19	3	68	13	15	22	9	3	62	21	17	9	22	3	72	34	21	15	9	6	85	42	26	21	18		107
Texas	4	2	4	4		14	1	0	2	0	4	10	5	1	5	4		15	2	0	2	2		6	11	4	5	2		22	5	6	5	4		20	0	1	4	5		10	1	3	3	2		9	7	5	2	3	1	18	7	7	5	1		20
Washington	5	4	16	20		45	2	1	6	12		22	7	2	7	6		22	6	5	4	4		19	8	3	4	6		26	10	6	8	3		27	13	12	5	8	1	39	14	17	7	4		42	21	21	19	8		68	30	19	19	20		86	30	34	20	21		105
	262	127	181	179	8	757	187	204	162	195	7	955	142	113	192	154	14	615	160	122	132	190	12	616	154	141	154	144	11	654	184	164	133	147	14	642	196	141	127	130	13	607	194	145	140	119	32	630	240	186	146	139	37	747	222	227	185	182	29	913	282	296	220	184	15	1000

Foot Rot in Sheep

By J. A. HOWARTH, Davis, California
University Farm, University of California

FOOT rot is a chronic infectious ulcerative disease of the interdigital structures and subcorneum of the foot, and remains more or less localized in that area. The economic importance of foot rot in sheep lies in the severe losses which the owner sustains from the long period of inactivity of the affected animals, from the loss of body weight, decreased wool clip, the diminished milk production at lambing time, and finally the probable infection of the new born and others.

Etiology

Heretofore, *Bacillus necrophorus* was incriminated as the etiological agent causing this affection, but, after long and careful examinations of the flora of organisms found in the discharges and necrotic tissue of the feet, a spirochete was found present in all cases. The spirochetes are approximately 9 to 11 microns in length and present 3 to 5 undulations or turns. Their spiral depth is from 0.2 to 0.6 microns, the amplitude is 0.6 to 0.8 microns, and width, 0.1 micron. The spirochetes are most successfully demonstrated in direct smears by Giemsa's stain; equally good results are obtained by gentle steaming with carbolfuchsin for three minutes. It would be unwise to class this organism as the etiological agent in this disease due to the fact that Koch's postulate has not been fulfilled. Owing to the difficulty encountered in cultivating this organism in pure cultures, experimental work has been handicapped. However, one is inclined to believe that this spirochete has some etiological relationship in this disease.

[1] MM. Ludovic et Pierre Blaizot, Treponema podovis n. sp., agent pathogene du Pietin des Moutons, Comptes Rendus, Des Seances De L'Academie Des Sciences, No. 20, Nov. 12, 1928.

The work carried on at this station is in accord with that done by Doctors Ludovic and Pierre Blaizot.[1] They classify this spirochete as *Treponema podovis* and believe it to be the organism causing this disease.

Symptoms

At first there is a slight lameness, and, on examination, the foot is found warm, due to the inflammation. Animals badly affected will go on three legs, or if the fore feet are affected, they rest on their knees especially while grazing. The lack of wear on the hoofs cause them to become over-grown and distorted, even curling into a spiral causing the wear

Fig. 1. Spirochetes in smear from material taken from lesions of foot rot. Stained with carbol fuchsin.

to come on the outer wall of the foot. Much of the horn becomes undermined and detached from the underlying tissue; and in old chronic cases, the hoof may be shed, exhibiting fibroid growths of new inflammatory tissue.

Morbid Anatomy

The primary lesion in foot rot shows a circumscribed redness and swelling, and a moist fetid, sweat, usually at the arch of the interdigital space. The epidermis of the interdigital space becomes

Fig. 2a. The lack of wear on the hoof causes them to become over-grown and distorted, the weight being thrown on the outer wall of the foot.

denuded, exhibiting yellowish white layers and raw ulcerated areas. As the infection invades the deeper structures, it advances beneath the horny layers affecting the more vascular and sensitive structures of the foot. When the affection assumes a more chronic state, the hoof starts to become detached in places from the underlying tissue, and a characteristic foul smelling, inflammatory exudate having a very offensive odor is exuded. This exudate contains an abundance of pus cells, fragments of ulcerating and necrotic tissue, many different kinds of bacteria, and great numbers of spirochetes.

Treatment

The feet that are over-grown or distorted must be carefully pared, and all horn that has been undermined and detached from the underlying tissue should be removed. In the more advanced cases where extensive invasion of the deeper tissues are involved, one must be more thorough in removing all necrotic erosions.

Many chemicals have been tried in the

Fig. 2b. The horn becomes undermined and detached from the underlying tissues in old chronic cases.

treatment of this disease with the hope of finding some agent that will effect a rapid cure. Antimony and potassium tartrate (tartar emetic) has been found

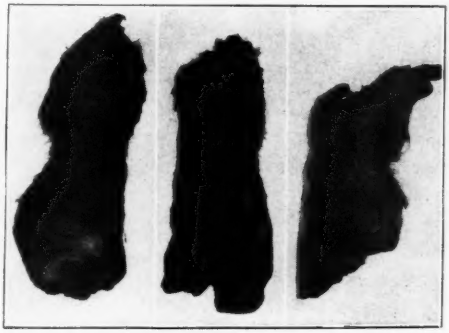

Fig. 3. The hoof has been partially removed to show how the infection has invaded the deeper structures advancing beneath the horny layers affecting the more vascular and sensitive structures of the foot.

to be the most active agent so far used. An ointment composed of enough lanolin

added to the powdered tartar emetic to make a thick paste and rubbed into the foot and between the dew claws after all the affected part is removed, brings about the desired results. One cannot be too conscientious in the paring and trimming of the feet. If any of the affection is allowed to remain under the horny part of the hoof where the drug cannot penetrate, the animal will soon show signs of lameness.

LOSS OF PIGS FROM ANEMIA

I am having a lot of trouble in a lot of pigs two to four months of age, very thrifty up to that age. About a week ago one was found dead and a few days later another, and in a couple of days another. The balance began to show unthriftiness, listless, dumpy, sleepy. I was called and made inquiry as to the feed, etc.

The sows are all mature. Their feed consists of 600 pounds oats, 300 pounds barley, 100 pounds soy beans, ground very fine and made into a slop, of which they were fed all they wanted. The sows as well as the pigs are in good condition and look thrifty.

I made a postmortem examination of the third pig that died and found engorged or very large liver, also a very large heart.

I took the temperature of several pigs and found them normal. I diagnosed the condition as hemorrhagic septicemia and gave all the pigs 2 cc of hem-sep aggressin. Upon finishing the treatment and prescribing for the sows, I heard a pig make a noise and looked in to find it dying. In a few minutes another died and then another and finally a fourth of the very last treated, which were also the very best in the lot.

I posted three and found a condition similar to that in the pig already posted, the heart very large and at the point where the pericardian is attached to the heart, very red in color. No diarrhea at all. The pigs look and act as if they have been poisoned. Three days later I was called again, and while there two more died and they showed similar postmortem findings.

The owner tells me now the sows are drying up in their milk, and of course the pigs are not getting enough to eat. I suggested he add 50 per cent bran to the ration.

One thing I did notice, this man was using some form of ordinary creolin dip or coal tar dip very thick, pouring it on the floors, and he said that the sows and pigs were very greedy to lick this up. But I could not find any irritation from it.

This is about the best description I can give you of this trouble, and if from the description you can help me to diagnose what is causing these pigs to go bad and die I would be very glad to have you do so. Only the biggest and fattest ones have died. Those that looked tough are still living, but are not very lively.—H. E. A., Ohio.

Reply: From your description, it appears that the pigs you refer to are dying from anemia. Write the Wisconsin Agricultural Experiment Station, University of Wisconsin, Madison, for their Bulletin No. 409, and in the meantime put these pigs on iron sulphate.

Use the commercial (not the chemically pure) iron sulphate (green vitriol), and give each pig one dram of a 1 per cent solution once a day. Copper is necessary for the assimilation of iron, and the commercial product carries this as a contamination.

There are some characteristic symptoms of anemia in pigs that you do not mention, but the fact that they are very thrifty; that it is the largest and fattest ones in the litter that die, and die suddenly, having an enlarged heart, and with no evidence of infectious disease, seems almost conclusive when taken with the history; the time of the year for pigs to suffer from anemia and kept on floors. Later in the season, when they can be out on the ground and eat dirt, you may expect the survivors at that time to gradually recover from the anemia without treatment.

Characteristic lesions of the disease are: Pale colored muscles, blood a lighter color than usual, fatty degeneration in the liver and flabby heart, much larger than normal.

Diseases Incident to Breeding Horses

VETERINARIANS possess information on the diseases incident to breeding horses far in advance of what is being utilized by breeders, and this is not altogether the breeders' fault. Veterinarians, as a whole, have been slow to inform the breeder of horses what may be done to improve his business through reducing the toll of disease.

In the vicinity of Lexington, we have examined 2800 barren mares, making the clinical and bacteriological examination on an average of more than twice for each animal, a total of more than 5,000 bacteriological and clinical examinations. We also examined more than 250 fetuses dead when foaled and more than 500 foals that died within a few hours or a few days after foaling.

The examinations have included also many thousands of pregnant mares. Of all the examinations of mares that were made, those made within one to nine days after foaling were the most fruitful of results of value to the breeder. Many examinations were made also of early pregnancy. These were animals returned for rebreeding in 21 to 60 days after being bred. A clinical examination revealed them to be in foal when the owner thought they had failed to catch on the earlier service. Experience has shown that some of these mares would have aborted if they had been bred again. So, the examination for the detection of the fact that they were in foal was of value to the owner of the mare and also to the owner of the stallion.

Considerable work has been done on the transmission of infection at the time of service. One-third of the 2800 barren mares examined were suffering from cervicitis, of sufficient intensity to be regarded as the cause of barrenness. Thus, we have at once one-third of the problem of barrenness in mares a problem of in-((69051 Apr 8 —10 os 16 ems 11 **Barnard** fection. Twenty-five per cent of the barrenness was due to streptococcic infection, five per cent due to infection with the encapsulatus and three and one-third per cent was classed as miscellaneous infection. All such infections are transmissible by breeding.

Most infected mares will not conceive. Most infected mares that do conceive will abort or produce a diseased foal. Less than ten per cent of diseased mares will produce a healthy foal. It is, therefore, sound economics not to breed any infected mares at all. The breeding of horses is not a game that the owner can play when the chances are nine to one against him. In our locality and with valuable stallions the service fee is a cash proposition. It ranges in amount from $500 to $5,000, and this must be paid whether a healthy foal, diseased foal or no foal at all is secured. The owner of the mare has the opportunity to breed her throughout the season. The stallion owner undertakes no further guarantee.

The owner of a diseased mare must pay this fee and as mentioned before, his chances are not more than one in ten of getting a healthy foal. The stallion owner, as well, has a stake in the matter, because if the same mares are returned to the stallion over and over throughout the season, obviously the number of fees for breeding are reduced by just the amount that the mares are returned.

In the examination of this large number of mares and giving opinions as to the advisability of breeding them, naturally a good many mistakes have been made, but on the whole, the times that the prognosis turned out to be right were far in excess of those in which subsequent events showed it to be wrong.

One case in particular that received a great deal of publicity, illustrates this.

* Notes from an address by W. W. Dimock, Lexington, Kentucky, at the Fifth Veterinary Conference, College of Veterinary Medicine, Ohio State University, March 19-21, 1930.

One breeder had a mare that he was absolutely certain that if she foaled at all, the foal would be a derby winner. And, although I assured this owner that it was useless to breed the mare or to treat her, because of the great stake, in his opinion, to be won in case she did foal, he kept on trying and bred her regularly throughout the season for eleven years. From this breeding, she conceived only once and aborted that foal in about five months.

A veterinarian must know the anatomy, physiology and pathology of the reproductive organs. Many do not know what is normal in these organs. Unless they do, of course, they cannot pick out what is diseased. No veterinarian is rendering a full service to his clientele until he can pick out the diseased animals and give a dependable opinion as to whether or not it is worth while to treat them.

Mares that are kept for breeding purposes, fall into three groups. Those that are normal, those that are diseased, and the in-between. It is the in-between group that requires the hard study.

The time of foaling in the mare is the critical time. All cases of new infection that we found were in mares that had recently foaled. Any work of prevention of disease must include the foaling mare, and this is just the one that the owner is apt to think it is unnecessary to give any attention to. She has just foaled and therefore he assumes that she is all right. Her resistance to infection at this time is very low. Yet the belief seems to be ingrained in the breeder that she must be rebred on the ninth day. This breeding on the ninth day after foaling, I believe, is responsible for more infection of the reproductive organs of the mare than all other causes put together, and further, it doesn't pay.

The examination of thousands of breeding records have shown conclusively that not over 25% of the mares bred on the ninth day after foaling, conceive, and you know a man must win 51% of the time to make it worth while. He can't make a profit losing 75% of the time and this is just the percentage against him when he breeds his mares on the ninth day.

Over 50% of all the mares examined have shown streptococcic infection in the uterus on the ninth day. This infection not only prevents conception in a great many cases, but where conception does occur, it is prone to result in abortion or a diseased foal.

Keep in mind if you are going to prevent navel ill, or joint ill, you have got to do it before the mare is bred. Streptococci live on the external genitals of mares and stallions all of the time, but this organism is not normally found in the uterus. You can culture the interior of a healthy uterus time and time again and never get any growth whatsoever, but you can't do this in a mare that has recently foaled. The essential thing is to wait a sufficint period after foaling for the uterus to rid itself of infection and acquire the normal resistance to infection. In healthy mares in the majority of cases, this will have occurred by the twenty-first day after foaling, but it is inadvisable to take a chance on even that. A bacteriologic examination should be made before the mare is bred, and if the uterus has not yet rid itself of infection and become sterile, a further wait is imperative. As mentioned before, the chances of getting a healthy foal when breeding under such conditions is less than one in ten, and it is a chance no breeder can afford to take.

My examinations have been made chiefly in the Blue Grass region of Kentucky, but letters from every part of the United States indicate to me, unmistakably, that conditions are exactly the same elsewhere, and the findings of our work in that section I believe are equally applicable to any other horse breeding section of the country.

Without a doubt, however, breeding diseases in the Lexington district are intensified, because horses are sent there from everywhere and of course, we have

collected diseases from everywhere. When the work was begun at the Kentucky station, the breeders, both the owners of mares and the owners of stallions, were exceedingly skeptical as to its possessing any value and were not inclined to follow veterinary advice in the matter if it was at variance with their own judgment or inclination; but a great change has come about as a result of this work. A recent examination of the advertisements of all the good stallions in the locality show that in nine cases out of ten the owners of these stallions require a veterinary certificate as to the health of the mare before they will breed her, and this, notwithstanding that a cash fee is demanded for the service.

The genital diseases of horses are such that the man who is trying to make a living by breeding horses, must be helped by the veterinarian or he will fail. There are no two ways about that proposition. There are examples on every hand to prove it.

In an examination of more than 300 foals that have died in from one day to six months of age, of navel ill or joint ill, the *B. vicosum equi* was found in over 50% of the cases. We often found it in pure culture in nearly every organ in the body, and all the evidence pointed to an antenatal infection. A search was made for the natural habitat of this organism. It could not be found in the manure, the ground, or on the bodies of the animals, but was finally found in the tonsilar crypts of healthy horses. It is not pathogenic for mature horses, but is fatal to young animals.

The prevention of streptococcic infection is purely a matter of cleanliness, which means chiefly a matter of soap and water, but as to prevention of the *B. vicosum equi*, we don't know very much.

In 1888 Williams described an outbreak of equine abortion in central Illinois. The description is just as good, just as clear and just as definite of this trouble as can be written today. Equine contagious abortion is just as truly a specific disease as is measles or small pox, and it is very acute. We have little of this trouble in Kentucky because the breeding mares are vaccinated, to a large extent. Equine contagious abortion has no relation to infectious abortion of cattle.

Equine abortion has a sudden onset in a herd. It can be stopped by vaccination, but it requires 30 days to do it. I recall a case of a breeder who was notoriously skeptical concerning contagious abortion. He began losing foals at first one or two per day, and in the course of two weeks, eight foals were aborted. At that time I was called and advised vaccination. The owner asked how long it would take to stop the abortions. I replied: 30 days. Without the slightest faith in the efficacy of vaccination, he told me to go ahead. You see he was feeling pretty low. All the mares were vaccinated and during the following 27 days, 40 foals were aborted, but not one after that. His mares are vaccinated regularly every year now.

In all my experience, I have known of only two cases of accidental abortion. One of these was as a result of an examination for pregnancy, and the other was in a mare that was frightened by thunder and lightning during a storm that came up in the night. In her wild fright she attempted to jump a wide ditch, but did not quite make it, striking the opposite bank, she rolled over and over to the bottom and struggled a good part of the night in deep mud. Soon after being extricated the next day, she aborted a foal.

An inviolate breeding rule should be, withhold from service any mare that isn't healthy, that is, genitally healthy. Another rule should be to observe cleanliness at the time of service, and this includes the stallion as well as the mare. In fact, cleanliness of the stallion is even more important. No washing at all of the external genitals of either animal is better than half washing. Cleanliness must be thorough. The secret of preventing chronic types of metritis lies in the protection of the foaling mare.

Next to breeding problems, our most

serious problem in raising horses is parasites. At three months of age mesenteric aneurisms are beginning to be found in colts running on infected pastures. At weaning time, these aneurisms may be as big as your head, and you have to raise colts free from these parasites if you expect a good performance from them. Colts will avoid more than 90% of all the troubles that affect mature horses if they are protected from parasites until they are two years of age and properly cared for. It is ridiculous to attempt to make a race horse out of a parasitized colt.

The prevention of parasites in colts is not an easy problem. Good sanitation, of course, helps and the rotation of pastures is very important. Likewise, it is important to treat animals to prevent contamination of pastures and feed and surroundings. There are probably a number of anthelmintics that are successful in removing parasites from horses, but for the round worms I usually use calomel.

PARTURIENT PARESIS TREATED WITH ARECOLIN HYDROBROMID

Case No. 1—On July 3, 1924, I was called to a sick cow and as there had not been a case of milk fever in this vicinity for a number of months, I did not carry my pump with me, which was just what I should have had. The cow was lying unconscious and as arecolin hydrobromid is the best glandular stimulant we have at present, I injected hypodermically one and one-half grains dissolved in nearly hot water. I returned in an hour to inflate the udder, and found the cow up eating hay. I left a tonic and orders not to give too much exercise for the next three days. The cow never missed a feed or fell off in milk production.

Case No. 2—On March 10, 1929, I was called to see a large Ayrshire that had calved three days before. I found the cow down, unconscious. A one-and-one-half-grain dose of arecolin hydrobromid was given and I started to inflate the udder, but before the third teat was inflated, the cow tried to rise and in five or six minutes more got up, emptied her bladder and bowels and called for her calf. I gave her a pail of warm water and left a tonic. The owner was happy.

Case No. 3—On July 4, 1929, I was called to a case of preparturient paresis, typical milk fever in appearance. The owner had still been milking the cow due to calve in about three weeks. The cow being heavy with calf was somewhat nervous about using arecolin, but the owner said the cow was no good as she was, and he was willing to stand the risk himself. I gave her one grain and as there was no bowel evacuation, I gave her an additional half-grain in thirty minutes, and continued the half-grain doses at half hour intervals for two hours. The cow got up, recovered and calved normally three weeks later. But it is always well to carry a pump in cases that have been sick for several hours.

In treating a case of milk fever, it is always well to examine the cow's feet, for about 20% will have laminitis especially if they have been lying for several hours, they are afraid to lie down again for fear they can't get up. Whenever I find one that has rather warm hoofs, I tie cold swabs around the feet and apply cold water every hour or so. I have never had one go wrong since adopting this method.

The very best treatment for laminitis for horses or cows in the early stages is crushed ice packed around each foot for 12 to 24 hours.

Deerfield, Ill. Herman J. Gastfield.

OPERATION ON BULL'S PENIS UNDER EPIDURAL ANESTHESIA

On October 24, 1929, a two-year-old Shorthorn bull was given a 60cc epidural injection of a 0.75% solution of procain at the sacro-cozygeal articulation. The bull was left in the standing position, tape applied to the penis, which then had but little power of retraction, and new growth near the end of the penis was removed with apparently very little pain to the animal, and now he is attending to his usual duties with good results.

Regina, Sask. L. L. Hewitt.

Problems Confronting the Small Animal Practitioner*

THE problems of the small animal practitioner are not alone in medicine and surgery, although these are serious. Some of our problems are of our own making and these are sometimes more difficult to solve than those presented by the sick animal. So-called modern business methods and high pressure salesmanship seems to have invaded the field of small animal practice to a degree unknown in the field of the general practitioner.

I have in mind an eastern city in which the small animal practitioners carried, as is customary, a card in the classified section of the local telephone directory. Soon at the urgent solicitation of the publisher of the directory, they commenced to take larger and larger space until soon all were taking full pages and the cost was by no means insignificant. When a new directory was to be gotten out and it appeared that the advertisements might be extended to double pages and even larger space, a conference was called with the result that all practitioners dropped back to simple card announcements in the classified directory at a very material saving to each of them and no disadvantage to anyone.

There have been other places where the veterinarians were not able to get together on this subject, to the disadvantage of all.

Our clients also wish upon us some very unnecessary problems, problems that have been solved only by diplomacy, and by knowing our job well.

Improved methods of transportation have brought many problems to the small animal practitioner. Not only the maiming of animals that results from being run over by automobiles and trucks, but exposure to strong drafts on a cold day on the running board of a car, to moving long distances and bringing disease with them, and others.

The pitfall for too many small animal practitioners is making a cursory examination. A careful examination pays well for the time that it requires. Time spent on diagnosis makes a good impression on the client and saves the veterinarian many an embarrassing explanation later. Many of our clients are easily offended, but at heart they must accept the truth in the long run, and it never pays to tell them anything else.

Distemper

Of our problems in medicine and surgery, distemper easily stands at the head, and in distemper it is the secondary invaders, as I see it, that cause the serious trouble. The true distemper infection only paves the way for the secondary invaders.

Distemper, as you all know, comes in waves. It is very serious on the upgrade and light on the wane. This is when reputations are made, and one must always take this into consideration when giving a prognosis. Distemper, of course, manifests itself in many different types, but on the whole the shipped dog suffers the worst and this again must be taken into consideration in both prognosis and treatment.

Distemper preventives have value, but they are tremendously over-rated by writers in dog magazines and sport publications and this again makes a problem for the veterinary practitioner whose clients are likely to take the articles in dog magazines and sport publications regarding the prevention of distemper at face value. You just can't live up to them. And, then again, there is the matter of the cost. Many of our dog owners have

* Notes from an address by J. F. Planz, Akron, Ohio, at the Fifth Veterinary Conference, College of Veterinary Medicine, Ohio State University, March 19-21, 1930.

contributed to the fund for distemper research and now they think they should get something for it. There are those that think practitioners should treat distemper in their dogs free. Or, at least administer the preventive free because they have contributed to a fund for research on this subject. Others think there should be a reduction in price to them because they are contributors.

In the treatment of distemper I hold that care is 75% and that no medicinal treatment can be routine. It varies with the form of distemper and with the animal. If the patient is a collie be careful.

Personally, I think that distemper is likely to be spread in veterinary hospitals, but whether we think so or not, the owners think so, and they will continue to think so. It is important to impress upon the owners the incubation period in distemper, so that we may have some chance to avoid the blame for cases appearing within three or four days after the animal is brought to us.

I believe it is wrong for the veterinarian to take distemper cases into his hospital. Of course, he cannot prevent taking in cases in the incubative stages, but I think that they should be removed, at once, to a separate building, or at the very least, to a contagious ward entirely shut off from the surgery and main part of the hospital.

The reason why I say never knowingly take distemper cases into your hospital is because the mortality is too high. It doesn't pay the owner and in the long run, what doesn't pay the owner won't pay you. Treat them at the owner's home as inexpensively as possible, or let some one else treat them.

It is very important that veterinarians get together in cities and districts frequently and iron out their difficulties. Social meetings are preferable to professional ones for this purpose. They are more successful in preventing knocking.

Rabies Americanis

Fright disease presents one of our major problems and this is a problem in no small degree, of handling the owner. The Germans call fright disease rabies Americanis and I think it is an appropriate name. There is a variety of ailments classed under this condition. In my belief two of them at least are contagious. Some of the conditions are certainly not contagious. One variety in young dogs is due to intestinal trouble and is remedied by proper treatment, change of diet and cleaning out. A type frequently seen in hunting-dogs is manifested only in the beginning of the season, then throughout the remainder of the season it doesn't bother them, but the same kennels will suffer from the same ailment at the beginning of the next season. This type, like the foregoing, is not contagious.

Then, there is a type that we frequently see in shipped-in dogs. It is very apt to spread to associated dogs and has the ear marks of a contagion. There is another type that is very common in association with distemper. I think it paves the way for distemper, rendering the animal so susceptible that escaping the disease is unlikely.

Foreign Bodies

Foreign bodies in dogs are more common than one might suppose. I believe that the abdomen of every dog brought to a veterinarian for examination, should be palpated for foreign bodies and other abnormalities.

Parasites

Intestinal parasites are an important problem with the small animal practitioner. Every practitioner in small animal practice must possess and be able to use a microscope. It means a great deal in diagnosis. The majority of the clients that bring us dogs, particularly young dogs, want them given worm medicine among other things. I believe that

much harm is done by indiscriminate worm treatment.

We should not worm a dog at all unless our microscopic examination of feces shows that it has worms, and we must be particularly careful in worming the dog that is not well. Just recently a dog was brought to me to be wormed. The animal was sick and I advised against worm treatment at that time. The owner insisted but I declined positively. On the way home, the owner bought some vermicide capsules at a drug store and in three hours, brought the dog back to me, dead. An autopsy revealed enteritis. That dog might just as well have died from my worm medicine as from the medicine purchased at the store. I was glad that I hadn't given it to him. Many similar cases can be recalled.

Hook-Worms

Two other conditions often associated are hook-worm infestation and distemper. Again I believe the parasitism paves the way for the infection. You cannot eradicate hook-worm from an outside run unless it has concrete floors. The hook-worm larvae will penetrate six to eight inches into the soil. They cannot be reached by disinfectants.

Hook-worm infestation is very serious in dogs and as I stated before, it cannot be eradicated unless the animals are kept on concrete floors. There must be no let-up in scrubbing and scrubbing and scrubbing again until the eggs are no longer passed in the feces. Hook-worms are no longer confined to dogs in the South. Dogs from all over the country go South for the hunting season, pick up hook-worm infestation and bring it back to their home communities.

It is necessary to check up on the old dogs over and over for a considerable period before you are sure you are rid of them. Old dogs may harbor hook-worm with little harm, although usually they don't do so well, but they certainly set young dogs afire.

Round Worms

Round worms are not difficult to handle, but an anthelmintic often fails to dislodge the worms. In such cases, the dogs should be treated the following day. It is somewhat remarkable that occasionally an anthelmintic will not bring away a single worm from the dog, and the same dose given the next day to the same dog, will be prolific in results.

Mange

The spring and summer might well be termed the scratching season for dogs. The sarcoptic mange mite is difficult to find. Don't give up if the first slide is negative. Make three or four. I remember an instance when I was working in Ostertag's laboratory. He had set me to searching slides and told me to keep at it until I found them. He came back just as I was examining the twenty-third negative slide. He said that was of no importance, to keep on. Fortunately I found what I was looking for on the eighty-eighth slide, but Doctor Ostertag seemed to think nothing of it. Probably he would have had several hundred slides examined before inclining to a negative diagnosis.

Sarcoptic mange of course, is easily diagnosed by the history and clinical symptoms, but we want the diagnosis confirmed by the microscope. The treatment offers no difficulties.

Demodectic mange, on the other hand, is a formidable opponent. The pustular form is incurable. There is a type of skin trouble that looks like follicular mange, but the organisms can never be found. Areas of pustular formation will be found, the pustules varying in size from the size of a pin head to the size of a quarter. It is a hard condition to treat and may require surgery. The use of antiseptics is important and it is also important to express the secretion of pus daily.

There is a type of dermatitis that appears just above the tail and is very difficult to treat. It is probably started by

parasites and may reappear all summer long. I use oily antiseptics for this particular dermatitis.

Fleas and Ticks

Fleas are of course, a troublesome nuisance and getting rid of them is no easy job. If the dog is permitted in the house the rugs soon become infested. A good vacuum cleaner will remove most of them, but about the only way to get rid of all of them is to hang the rugs up in the open air and spray them with high test gasoline.

Of course the cat and dog must be freed of fleas or they will reinfest the rugs.

Dogs returning from the South often bring wood ticks with them and these wood ticks are sometimes found in household rugs in enormous numbers. Killing them is no easy problem. I have dropped them in pure cresol and seen them swim out. Coal oil and arsenic dips kill them, but they are not practical applications for household rugs, and unless the ticks are gotten out of the rugs, they will reappear on the dogs and on the people too.

Outside runs for veterinary hospitals or public kennels are no good unless they are floored with cement. They merely serve to infest with parasites all dogs that are permitted on them.

Ear Canker

Ear canker is a common problem of small animal practice. There are various forms of ear canker and all are troublesome. Nearly all cases in Angora and Persian cats are due to ear mites. Many cases in dogs are also due to parasites.

Cesarean Section

Cesarean section is a very simple operation in simple cases of dystocia, but in delayed cases it is a different matter. There it is frequently followed by infection, not because the operation has caused infection, but because the infection was already there, in fact, in all probability the infection was wholly or at least in part, responsible for the delay in parturition. I know of one veterinarian who operates on hundreds of these cases one or two days before parturition is due. Of course, he has a wonderful reputation for success.

COLLOID SILVER PER OS IN BANG ABORTION DISEASE

Since the results in the treatment of contagious Bang abortion with the different biological products have been more or less unsatisfactory, a number of investigators have directed their attention towards chemo-therapy. Dr. Leuthold, of Maschwanden, Switzerland, has just now published his inaugural-dissertation entitled "Syrgotral zur Bekämpfung des seuchenhaften Bangschen Verwerfens beim Rinde" of which a short abstract may follow:

"Syrgotral is an odorless and tasteless 1.6% watery solution of Syrgol, a solid substance containing 20% of silver in the form of colloid oxid of silver and of colloid silver. Since its application is intended *per os,* hydrolysed albumen-colloids of the gluten-group have been added to the solution in order to prevent disintegration from the gastric juices. After a positive diagnosis of Bang abortion by means of the agglutination test had been established, Dr. Leuthold submitted in his experiments 267 cows and heifers in 22 herds to the Syrgotral treatment. The best results are obtained when Syrgotral is administered before the animals are bred and during the first two months of pregnancy, or during the 7th, 8th and 9th month of pregnancy. Additional strict sanitary measures are observed. An extensive search in the existing literature pertaining to the subject has been carried on by Dr. Leuthold and not less than 91 literary sources are cited at the conclusion of the dissertation.

I wonder if the non-specific action of Syrgotral could not be increased by a simultaneous introduction into the system of large doses of bacterin.

Fort Saskatchewan, Alberta, Canada. C. H. Grunert.

Control of Pullorum Disease*

POULTRY men are keenly alive to the economic importance of pullorum disease. This disease, commonly known also as bacillary white diarrhea, is preeminently a disease of baby chicks. The susceptibility to infection decreases markedly after the fourth day, and deaths in young chicks mostly occur within the first two weeks after hatching.

Not much can be done for the infected chick and probably it is inadvisable to attempt to save them, as they may carry the infection in mature life and transmit it in their eggs. All measures should be taken to prevent the spread of the infection. Among such measures may be mentioned hypochlorite solutions in the drinking water. A good many poultry men have considerable faith in this measure, but it is of doubtful value, since the infection is spread principally by down and dust particles in the air of the incubator and enters the chick via the respiratory tract.

Dark brooding for the first 72 hours is of value because it keeps the chicks quiet and prevents them from stirring up dust and down, that carries the infection and also from taking in the infection by way of the digestive tract.

The great dissemination of infection probably occurs in the insubator during the first few hours after hatching. Keeping the humidity in the incubator very high materially lessens the dissemination of infection at that time, by preventing the down and dust from becoming dry and circulating readily in the air.

Frequent disinfection of the incubator with formaldehyd gas is a fairly effective means of preventing the spread of the infection. For this purpose 35 c.c. of commercial formalin and 17.5 grams of potassium permanganate are used for each 100 cubic feet of space in the incubator. The maximum effects from fumigation are obtained when this procedure is followed three times at eight hour intervals during the period the hatch is taking place.

Pullorum disease is the only disease that is spread widely by machinery and the baby chick industry probably is responsible for the tremendous extension of this disease during the past decade.

The importance of using eggs for hatching from non-infected hens cannot be overestimated. Carriers among mature birds should be eliminated as far as possible by culling and then by the agglutination and pullorin tests. A considerable number react to the agglutination test that will not react to the pullorin test and the reverse is also true, however, post-mortem and bacteriological findings are negative in a very high percentage of the reactors to the pullorin test only.

A flock of 201 Rhode Island Red hens, in which pullorin disease existed, was tested, using both the pullorin and agglutination tests. Twenty-four reacted to both tests, 20 reacted to the agglutination test only and 27 to the pullorin test only. The eggs from each group were hatched in separate incubators and the chicks brooded for a period of one month in separate brooders. From group No. I, that is the 24 that reacted to both tests, 727 eggs were incubated and 289 chicks were hatched. Of these 126 died and 92 of them were cultured and 88 were found infected with S. pullorum. From group No. II, that is the 20 birds that reacted to the agglutination test, but did not react to the pullorin test, 604 eggs were incubated and 274 chicks hatched. Of these 166 died and 127 were cultured. Of this number 112 were found positive for pullorum disease. From group No. III, that is the 27 birds that reacted to the pullorin test but did not react to the agglutination test, 942 eggs were incubated and 431 hatched. Of these, 11 chicks died and seven were cultured and all found negative for S. pullorum. Since none of the chicks that died from this group showed pullorum in-

*Notes from an address by Alvin Broerman, Reynoldsburg, Ohio, at the Fifth Veterinary Conference, College of Veterinary Medicine, Ohio State University, March 19-21, 1930.

fection, it is a logical assumption that none in this brood were infected, and therefore, we must conclude that the positive reaction to the pullorin test in the 27 mature birds was incorrect and the test failed to this extent.

This experiment indicates a far greater accuracy for the agglutination test than it does for the pullorin test, since the 44 birds in the two groups that reacted to the agglutination test, produced eggs with a high percentage of infection, and of the two groups that reacted to the pullorin test, group No. I of 24 birds produced eggs of a high degree of infection and group No. III of 27 birds, apparently produced non-infected eggs.

Discrepancies have occurred in the application of the agglutination test in different laboratories. This is believed to be due to a lack of a standard for the test, and to the use of a poor antigen. Both of these faults are being corrected as experience with the test accumulates. The technique of workers varies greatly at present.

The agglutination test is frequently criticised because it will not remove all of the infected birds; but with all its shortcomings, it has the advantage that in the main, those birds that do react are usually infected.

Two methods of applying the agglutination test are used and comparative tests show that the two methods are about equally satisfactory. The tube test perhaps is best for laboratories, but the rapid agglutination test (plate method) is recommended for practitioners.

There is one other test for pullorum disease, known as the whole blood test, and was devised by Bunyea, Hall and Dorset. They have used it on only a limited number of birds. The test can be made in a very short time and therefore, it is not necessary to leg band the birds. Since the antigen used is a suspension of living organisms it has the disadvantage of being dangerous to use in a poultry house because of the possibility of spreading disease. It was tried on 85 birds at the Ohio Experiment Station and the results did not agree with the agglutination test, either the tube or the plate method. It seemed impossible to definitely evaluate the reactions. By this test only pronouncedly positive reacting birds could be detected with any degree of accuracy. The whole blood test has not been used sufficiently to make a definite statement as to its value, but experience so far is somewhat against it.

THE BEST IS USUALLY CHEAPEST

Last December I was called one Sunday noon several miles from Olathe to autopsy steers and diagnose the cause of death. Upon arrival I found four dead. Autopsy showed typical lesions of both blackleg and hemorrhagic septicemia by which a diagnosis was made.

Knowing the owner and also being in the neighborhood of a registered quack, I advised the owner that he could get these cattle vaccinated for both blackleg and hemorrhagic septicemia much cheaper than I would do it and that if I did the vaccinating I would vaccinate all the cattle the second time for hemorrhagic septicemia. I would not dare tell in print what the owner said, except this, that he said the quack had already vaccinated these cattle some thirty days before and he was through with cheap vaccination.

I vaccinated the herd that afternoon. Revaccinated them for hemorrhagic septicemia three days later, with the very best results, no losses after the first vaccination.

I believe that good vaccines, large doses properly administered will give satisfactory results, in all cases if administered in time. But I am not a believer in cheap vaccines, "dope," quack or farmer vaccination. It is a fact they get satisfactory results from a lot of vaccinations and from cheap vaccine "dope" too, but in many cases their results are disastrous and the losses heavy and so many times the veterinarian is then called. That saving in cheap vaccination does not justify the loss.

Olathe, Kans. S. L. Stewart.

Treatment and Control of Parasites of Swine

THE more we learn about parasites, the greater our appreciation of their importance and the more is the conviction borne in upon us that we have not made progress in the control of parasites comparable to the progress we have made in the control of infectious diseases. The attack of the parasite is more insidious and less spectacular than foot-and-mouth disease for example, or almost any other infectious disease, but its importance is none the less sure.

The farmer produces hogs to make money and a parasitism may entirely defeat that purpose without killing the hog. In fact, a non-fatal parasitism of pigs may mean a greater loss to the farmer than an attack of hog cholera in the same pigs, because the parasitism may be such as to permit the pig to continue a source of loss throughout many months until it is marketed and accumulate a loss in this way greater than the whole value of the pig at the time of the attack.

Parasitism in this country is spreading to new areas and at the same time becoming intensified in the old areas. In the corn belt, nearly every pig is host to from three to seven species of parasites. The loss that ensues is not only a quantity but a quality loss as well. It is very generally recognized that the same amount of feed and care will produce less in a heavily parasitized pig than it will in a healthy pig. It should also be equally appreciated that the quality of the product will likewise be lowered. The Bureau of Agricultural Economics has set standards for meats and meat animals, and prices are in a degree based upon these standards.

The correct type of animal and a properly balanced ration are important in swine production, but health is basic. Without it all the skill expended in selection of type and feeds will not avail to produce pork at a profit and that, let us not forget, is the purpose for which the farmer raises swine.

The veterinary profession has, on the whole, been too lax in the matter of handling parasitisms; in diagnosis, treatment and prevention. The control of parasites is a veterinarian's job all the way through. There has been too much mass treatment in the past and too much slip shod diagnosis, too much of turning the treatment over to the owner and with insufficient directions as to the prevention of new infestations. Altogether, in not a few cases, we must admit we have made a bad mess of it.

Mass treatment, mass dosage, is absolutely inefficient in the handling of parasites of swine. Individual dosage of the parasitized animal is the only reasonable way. Every veterinarian is aware of the dangers of infections from the eggs of parasites eliminated at the time treatment is given, and yet how often in the past has this danger been ignored and no provision made for the disposition of the highly infectious feces. The simple common sense demand that pigs be removed from the infected area after treatment for ascarids, for example, has been frequently neglected. Of what permanent value is it to the pig to free him from parasites if he is permitted that same day or the next day or the next week to injest some thousands of infective ova or larvae. What benefit has the farmer received from such treatment to reimburse him for the cost of the parasiticide and skill required for its proper use?

Autopsies

Autopsies are very important in making a diagnosis of parasitisms, and they must be made with care and skill. The differentiation between a parasitized lung, for example, and the lesions of milliary tuberculosis is not always easy. In fact, it is often

*Notes from an address by H. B. Raffensperger, Miles City, Montana, at the Fifth Veterinary Conference of the College of Veterinary Medicine, Ohio State University, March 19-21, 1930.

difficult and the decision must be made not so much upon the character of the lesions in the lung, as upon the presence or absence of lesions in the mediastinal lymph glands and the presence or absence of larvae in the mucus exudate in the bronchioles.

Lung Worms

In the case of parasites having an intermediate host discovery of the intermediate host is often the key to successful control. Not infrequently the intermediate host stage is the weakest point in the life cycle of the parasite and indicates the point at which the attack should be made, but such is not the case in the lung worms of swine, the intermediate host for which is certain species of earth worms. How are we going to prevent swine from eating earth worms, and at the same time take advantage of the low cost of pork production on rape or alfalfa or sweet clover pasture or permit them to run on any other range?

Kidney Worms

Recent investigations have shown that the infective larvae of the kidney worms of swine is not capable of penetrating the uninjured skin. Infestation ordinarily occurs *via* the mouth. Once ingested, these larvae are great wanderers. They penetrate the liver, the muscles, the lungs, exist freely in the abdominal cavity and a certain percentage of them reach the kidney and the peri-renal fat and there develop. The annual loss caused by this parasite reaches into the millions of dollars.

Stomach Worms

There are three stomach worms in swine. As their names indicate, all inhabit the stomach and all of them cause ulcerous condition of this organ. The red stomach worm, *Hyostrongylus rubidus* has a direct life history. That is, the infestation occurs from swine to swine. The other two, *Arduenna stronglina* and *Physocephalus sexalatus* require an intermediate host for their development. The small black dung beetle is the intermediate host of these species or at least one of the intermediate hosts. There may be others.

Thorn Headed Worms

The thorn headed worm of swine also requires an intermediate host. The larvae of several species of beetles are intermediate hosts of this parasite.

Round Worms

The common round worm of swine, *Ascaris suum* is another parasite with a direct life history. That is, no intermediate host is required for its development. The adult worm lives in the intestine and produces eggs which pass out with the feces where certain stages in their development are undergone if the temperature is right. After several days the active embryonated or infective stage is reached and when the eggs in this stage are ingested by swine, the embryos escape and the free embryos or larvae invade various tissues, migrating to the lungs where the greatest harm is done to the host. If the eggs are ingested before they reach the infective stage, infestation does not occur.

Most cases of thumps in pigs up to three months of age are due to the larval stage of round worms in the lungs. Thumps can unfailingly be produced in pigs of this age by feeding them infective ascarid ova. However, no amount of mass ingestion of infective ova will produce thumps in the mature hog. As is well known, mature swine are quite resistant to this parasite.

The means of control of ascarid infestation of swine and at the same time the control of the whole group of filth borne diseases, has been fully worked out and it is commonly known as the McLain County System. It is so well understood that a description is not necessary at this time.

Eighty four cases of trichinosis was reported by the California Department of Public Health in January 1930. The majority of these cases occurred in San Francisco and vicinity. Thus in spite of information that has been disseminated relative to the danger of consuming raw pork, this malady occurs.

DISEASES OF SWINE*

It is important that the veterinary profession retain the confidence of the live stock industry. To do this, it must render a good and ever better service in the prevention and control of disease. The farmer raises swine to make money out of it, and it doesn't take much disease to wipe out the profit and thus defeat the purpose of the swine industry.

Next to dairy products, pork products are the most valuable item in our animal husbandry. As the industry develops, the problems of disease control become more important and more difficult, and hence the necessity that veterinarians keep themselves informed of the results of research in this field and ever equipped to render a service based upon the best known information.

Hog Cholera

For example, our ideas of hog cholera were entirely revolutionized between the years 1898 and 1907. One could not think of attempting to handle the problem of hog cholera now with only the information available before it was discovered to be due to a filtrable virus and before the value of the simultaneous use of serum and virus inoculation was known.

Enteritis

Since 1907 our notion of the harmfulness of enteritis has been completely revolutionized. Next to cholera it is responsible for the greatest losses in swine. The suipestifer organism is the most important factor in its cause, but coccidia are involved. There are at least two forms of enteritis and probably others. The copper sulphate treatment for enteritis is the most satisfactory so far tried.

"Flu"

Infectious bronchitis in swine has assumed importance only within recent years. Not very much is known about it. It is difficult to study because it is seasonal in appearance and uncomplicated cases are of only a few days' duration. No immunity occurs as the result of an attack. Two and three attacks in the same season are common. The nasal secretions are infectious but the blood is negative.

A pleo-morphic bacillus has been found in cases of infectious bronchitis with considerable regularity. It is thought by many to be responsible or at least partly responsible for the affection.

The animals lose condition rapidly and they are slow to regain it. Pneumonia is a not unusual complication. Sanitation is the only effective prevention. Treatment consists in supplying warm quarters, well bedded dry and free from draft. The diet should be light until the animals have entirely recovered.

Mange

Mange is not fatal to swine, but results in considerable loss. Forty per cent of the hogs in some localities are affected. The loss in five states is estimated at more than $2,000,000 annually.

* Notes from an address by C. H. Stange, Ames, Iowa, at the Fifth Veterinary Conference, College of Veterinary Medicine, Ohio State University, March 19-21, 1930.

THE WASTE OF DISEASE

During the fiscal year ended June 30, 1929, inspection was made of 36,980 poultry flocks in Iowa, containing 5,238,365 fowls. Of this number, avian tuberculosis infection was found in 5,035 flocks.

During the fiscal year ended June 30, 1929, the Bureau of Animal Industry records indicate that 165,239 flocks, containing approximately 16,765,000 fowls, were inspected for tuberculosis, of which number 10,654 flocks, or 6.4 per cent, were found to be infected. A total of 14,129 fowls were posted, 8,836, or 62.5 per cent of which disclosed evidence of tuberculosis.

The eradication of bovine tuberculosis, not only as it affects cattle, but also other forms of livestock, is a direct drive against the waste caused by disease. It is also important in preventing waste of human efficiency through the ravages of tuberculosis contracted by consuming livestock products from untested animals.—M. G. Thornburg, Iowa Secretary of Agriculture.

Diseases of Poultry

POULTRY practice does not amount to very much to veterinarians and it may never amount to much, but I believe it should be given more attention and that, in many localities it is destined to be an important source of income to veterinarians who have qualified themselves to render a good service in this branch of veterinary science. From the beginning of time up until the period of the World War, poultry husbandry consisted in just keeping poultry. Chickens were chickens and eggs were eggs. But, the increase in the prices of poultry and eggs that came about during the World War and has been maintained since, brought about a sudden awakening.

Before the World War, less than 10% of the specimens sent to the North Dakota Agricultural Experiment Station for examination were from poultry. Since the War, 75% to 90% of the specimens received there have been from poultry, and an equal proportion of the inquiries for help in disease control have been appeals for help for the control of poultry diseases.

Prior to 1912, the federal government had appropriated no money for poultry disease investigation and when this enormous demand came upon us for information concerning poultry diseases we were entirely without a trained personnel. Now the federal department of agriculture, every state agricultural experiment station and many private investigators are at work on various phases of poultry disease investigation. One cannot depend upon the old text books of veterinary medicine for information concerning poultry disease control. One must depend upon the bulletins of agricultural experiment stations and veterinary periodicals. Most veterinary colleges now have courses in poultry pathology and a goodly number of them give short courses or hold conferences for veterinary practitioners in which the subject of poultry diseases is stressed. I believe that there is an acute need for regular post graduate courses for veterinarians in poultry pathology. Such courses should run for a whole term or at least for several weeks.

There is an investment of one and one-quarter billion dollars in the poultry industry and it deserves still more attention than it has received. Many veterinarians, unfortunately, have neglected or refused the opportunity to serve the poultry industry, and this results in impericism on the part of county agents and others not fully qualified.

If poultry practice is properly nurtured by veterinarians, it will be a not inconsiderable source of income all of the time and a boon in lean years.

There are no specifics available in poultry practice but the same is true of other practice. Many veterinarians have looked with disfavor upon poultry practice because of the large amount of free advice they are called upon to give in connection with it, but I think that this is a practice-building measure of real value. Every veterinarian must know his poultry, especially chickens and turkeys, feeding, watering, and hygiene.

If you have all the practice that you want and are sure that you will always have sufficient, you can afford to disregard poultry practice. If not, you had better cultivate it, not only for its own sake, but for the additional practice it will bring you with other animals.

The baby chicks are the victims of many hazards, not alone pullorum disease, which is perhaps the most important, but the hazards of transportation, of being carried for hundreds of miles in hot cars and left standing on cold railroad platforms, or in cold store houses, and of exposure during transportation from the

* Notes from an address by A. F. Schalk, Fargo, North Dakota, at the Fifth Veterinary Conference, College of Veterinary Medicine, Ohio State University, March 19-21, 1930.

railway station to the farm. All of these hardships increase the susceptibility to pneumonias and diarrheas from which there are great losses in baby chicks.

It is doubly important that the highest type of sanitation be maintained in the incubator. Pullorum disease, as has been discovered recently, is spread chiefly by the down that floats about the incubator from the newly hatched chicks as soon as they become dry.

Coccidiosis is prevalent in chicks from 10 days to four months of age, and occasionally in chronic form in mature birds. To prevent the spread of the disease, it is necessary to keep the chickens away from infected droppings. This may be accomplished by the use of hardware cloth floors. Buttermilk and bismuth to soothe the raw surface of the bowels is of advantage in the treatment. Where hardware cloth is not available, if the chicken pen is moved every hour during the day time for three days, the outbreak of coccidiosis will usually subside.

The turkey industry is becoming an important one in North Dakota. Many farmers are getting more from their turkeys than for the produce of the rest of the farm. I know a North Dakota veterinarian who markets from $4,000 to $5,000 worth of turkeys a year, and a farmer near Fargo who marketed 2200 turkeys last year.

Turkeys will die as early as three and one-half to four months of age from tapeworm infestation. There are at least four different kinds of tapeworms that infest turkeys in North Dakota. One stage of all tapeworms, as you know, is passed in an intermediate host. The intermediate hosts of tapeworms of chickens include the earth worm, snails, house flies and beetles and perhaps there are others. Of these I think the house fly is the most important in North Dakota. I recall three farms, one where the sanitary conditions were poor and house flies enormously numerous; another about the average farm, and a third where sanitary conditions were very excellent and there were very few flies. On the insanitary farm, the loss from tapeworms was very high. On the average farm, there was some loss, but not nearly so much. On the very clean farm, where there were practically no flies, there was no loss from tapeworms and in an examination of a number of birds from that farm dying from various causes, no tapeworm infestations was found.

The onset of death from tapeworm infestation is sudden and four or five days only may elapse from the time the birds appear to be doing well until they commence dying. I have found as many as 200 tapeworms in a young turkey.

The best treatment is kamala, but it must be used with care if the birds are not thrifty and particularly if there is any coccidiosis infection in the flock. Healthy birds withstand doses of kamala of the following size, without injury.

18 days of age, ¾ of a grain.
21 days of age, 1 grain
24 days of age, 1½ grains
28 days of age, 2 grains
38 days of age, 5 grains
47 days of age, 8 grains
53 days of age, 10 gains
60 days of age, 12 grains
67 days of age, 15 to 30 grains.

If the birds are weak or badly parasitized, the dose should not be more than one-half of this size. In fact, a parasitized bird may not weigh more than half as much as a non-parasitized bird, so if it gets just half the dose of the normal bird of his age, it is getting a dose sufficient for his weight, and frequently it is too much for him.

If there is any doubt in your mind as to whether or not the birds are strong enough to stand parasite treatment, treat four or five and wait until the next day. If they live, perhaps the same treatment can safely be given to the remainder of the flock.

Round worm infestation is not a problem in the turkey industry in North Dakota. Many of these worms are to be

found in the adult birds, but they do not appear to harm them.

Our farmers have learned that they cannot raise turkeys and chickens on the same ground on account of black head.

As a general measure against intestinal parasites, tobacco is very satisfactory. Turkeys like tobacco just as well as men and women like it, and many turkey raisers believe that their birds thrive better when given tobacco dust in their feed all the time. One pound of tobacco powder should be mixed with 16 pounds of mash. The turkeys eat the mash more readily and eat more of it when tobacco is mixed with it than without it.

In an experimental way we fed the poults in fifty flocks Goldleaf Tobacco Dust in their mash from the time they were hatched till they went to market. This was carried on for two years and a part of the third year. The turkeys were very thrifty and there was no damage done in any way that we could determine. For chickens we mix one pound of tobacco dust to twenty-five pounds of mash.

Necrotic enteritis is a frequent ailment of young turkeys. The lesions look just like the lesions in necrotic enteritis in young pigs.

Sour crop is a frequent ailment of turkeys that eat a large amount of vegetation. I believe that a 1% solution of copper sulphate is a fairly effective treatment. The birds should be put on a light grain ration for a short time and they will recover.

There is a condition among the turkeys of North Dakota that I have not seen described elsewhere. It results in small whitish-grey areas distributed along the digestive canal from the crop to the proventriculus. There is a little hard hook like protuberance from the center of these. Death is caused by blocking of the passage between the crop and the proventriculus. Last year, I saw three or four cases of this on each of thirty to forty farms.

CHORAL NARCOSIS IN THE DOG

We note question by N. J. T., Tenn., in April issue, regarding the anaesthetization of dogs by using enemata of chloral hydrate solution.

In reply the dosage of one dram of chloral to one ounce of water for each twenty-five pound weight of animal is recommended. In our experience a solution of this strength is irritating and will cause an inflammation of anus and rectum in large percentage of animals.

For past several years the practice followed in our hospital has been to place four ounces chloral hydrate crystals in large mouthed half-gallon bottle, add water q. s. to fill for stock solution. This makes a solution of 30 gr. to the ounce—just half the strength recommended to your correspondent. A two-ounce dose syringe of this solution for each 25 pound body weight of animal is used for dogs with strychnin poisoning and pets being prepared for chloroforming until dead. We find that even this strength solution is irritating to the mucous membrane, but the emergency of the occasion justifies it in strychnin poisoning, and of course, is immaterial in the dogs that are to be destroyed.

For operative procedure eight ounces of stock solution is diluted with eight ounces water and same dosage is used (two ounces to twenty-five pound weight). As soon as animal is groggy, usually about ten minutes, ether inhalations are administered if complete narcosis is desired. The chloral alone in this strength is considered excellent restraint proceedure for animals to be catheterized, examinations of oral cavity, pharynx and larynx, teeth scaling and even manicuring.

In proper strength solution we have not had any ill after effects of any kind from use of chloral hydrate, and its use as outlined is so simple that its administration can be taken care of by attendant.

San Antonio, Tex. U. E. Marney,
V. H. Fondren.

Identification and Control of Intestinal Parasites*

THE successful treatment of parasites is dependent upon a correct diagnosis; upon identifying the parasite for which the animal should be treated. For internal parasites, this is accomplished chiefly by the microscopic examination of portions of the feces for the identification of parasite eggs.

What is known as the smear method of examining feces is the one mostly used. It consists of spreading a small particle of feces thinly upon an ordinary glass microscope slide and examining under low power magnification. It is not very satisfactory since in this way, but a minute portion of the total amount of feces can be examined, and unless the parasite eggs are numerous and somewhat evenly distributed, they may not be found in the small portion of feces that can be examined in this way.

A much better method of examining feces for the detection of parasite eggs is known as the sugar method. Although this method is very simple, the proper equipment for carrying it out is necessary. The equipment required is a microscope, which of course, is required for the smear method; slides; test tubes; wood applicators; and a centrifuge. A hand centrifuge is best, but an electrically driven centrifuge is quite satisfactory. A stock sugar solution is also necessary. This is made up by dissolving one pound of granulated sugar in 12 ounces of hot water. One per cent of phenol is added to prevent fermentation.

As mentioned in the foregoing, it is important that considerable feces be used to make a thorough examination. It isn't safe to base a negative finding upon the examination of a small amount. Roughly, a handful of feces should be used for an examination. The more the better.

Mix the feces with water until a sloppy suspension is obtained and then strain to remove the coarse particles. A tea strainer does very well for this purpose, but I like a piece of cheese cloth even better. If a tea strainer is used, it must be thoroughly cleaned before it is used again. If it isn't, some eggs may adhere to the strainer and contaminate the next specimen poured through it.

Pour a portion of the strained material into a centrifuge tube, filling the tube less than half full. Then add an equal amount of the sugar solution and mix thoroughly. Next centrifuge for one minute at the rate of 1500 r. p. m. This time need not be exact but approximately one minute is sufficient or the tube may be set aside and let stand for five or six hours.

After removing the tube from the centrifuge, or after separation has been effected by gravity for a period of five or six hours, the ova will be highly concentrated at the top of the solution. To get a specimen for examination, touch the surface of the solution lightly with some instrument, preferably a glass rod, that has a small flat head on it made by heating the rod until it is soft and then pressing against a cold metal surface. Eggs and liquid will adhere to the surface of the rod and can be transferred in this way to the slide. Put a cover glass on the drop of solution thus transferred to the slide and it is ready for examination. In this way a high concentration of parasite eggs can be obtained. The specimen will also be free from particles of vegetable matter or other objects that may confuse the examinator.

A disadvantage sometimes urged against this method is the time required, but actually it requires less time than the

* Notes from an address by R. E. Rebrassier, Columbus, Ohio, at the Fifth Veterinary Conference, College of Veterinary Medicine, Ohio State University, March 19-21, 1930.

smear method, when the time that is required to examine the smear is taken into consideration, and far better results are obtained by the sugar method, since the eggs being free from extraneous matter are much easier to identify.

LIVE STOCK POISONINGS

We are again entering the season wherein the poisoning of live stock is much in evidence. In our experience intentional poisonings are extremely rare, and many accidental poisonings could be avoided by the exercise of common sense. Common sense has been defined as horse sense and horse sense as "stable thinking," hence the procedure should be familiar to the veterinarian.

So-called sweet clover poisoning is encountered on many farms, particularly in the northern part of the State, at this time of the year. Here is a chance to apply horse sense to cattle. The trouble appears to be due to a toxic substance produced by the action of molds upon the sweet clover. Young cattle are very susceptible and should be guarded against this intoxication, for the injurious material appears to reach its maximum efficiency during the late winter and early spring. The condition may be confused with black leg or anthrax but "stable thinking" should clear up the situation. We have no anthrax in Michigan at present and black leg is extremely rare. Remember the so-called sweet clover poisoning is not an infectious disease and hence the cardinal characteristics of such a disease are not in evidence, although swellings or tumifications such as occur with black leg or anthrax, or failure of the blood to coagulate, a condition which may be found with anthrax, are in evidence. Beware of pitfalls. Make careful inquiries before dehorning, castrating or performing other operations upon young cattle at this time of the year. Fatal hemorrhages might be decidedly embarrassing.

The open season for paint cans has almost arrived. Cattle will soon be liberated from the confinement which has existed during the winter and will proceed to investigate all rubbish heaps and piles. They do love paint. The feeling is not mutual. For some peculiar reason cattle are very susceptible to the action of lead and can be fatally poisoned with relatively small amounts.

The one exception to the statement regarding malicious poisoning relates to dogs. Certain morons, or persons of less intelligence, periodically attempt to poison all the dogs in their particular community. Strychnin is the agent usually employed and frequently other animals and birds are destroyed. A recent newspaper report of the terrible ravages of a new and highly fatal disease which was killing dogs, cats, squirrels and birds in one locality, bears all the ear marks of a report of malicious strychnin poisoning.—*Michigan Veterinary News.*

SIX KINDS OF ENEMIES

The enemies of sheep are many and varied, but fortunately, few diseases attack range sheep. We may divide sheep trouble into six general classes:

First—Predatory animals, such as coyotes, dogs, bears, etc.

Second—Parasites, such as maggots, scab, stomach worms, lungworms, ticks, and a host of others.

Third—Poisonous plants, such as death camas, lupine, loco, wild pea, sneeze weed, rubber weed, Johnson grass, larkspur, wild parsnip, water hemlock, woody aster, grease wood and a number of others.

Fourth—Unseasonable weather, such as late blizzards, etc.

Fifth—Sporadic or noncontagious diseases, such as bloat, lambing troubles, goiter, digestive troubles, pneumonia and ewe paralysis.

Sixth — Infectious diseases, such as hemorrhagic septicemia, footrot, blackleg, rabies, sheep pox and many others.—E. T. Baker in *The Idaho Farmer.*

COCKLEBUR POISONING IN SWINE

A correspondent writes:

"On Saturday evening a client fed his 23 shoats as usual and all were hale and hearty. Early Sunday morning, 19 were found dead, scattered in the yard and houses, skin somewhat reddened, carcasses bloated, but no evidence of a struggle. There had been a shower about midnight and apparently these pigs had died before the rain.

"Upon autopsy the stomachs were found full of corn, highly inflamed, also portions of the intestinal tract showed marked inflammation of the mucous membrane. The bladder, heart, kidneys and lymph glands appeared mostly normal. The spleen and lungs were more or less mottled but varied in the different posts.

"These shoats weighed an average of 115 pounds and were daily fed in a corn field which last year had given a crop of cockle burs and corn (note the arrangement), and the young plants were on a stand of clover. In the stomach content were found plenty of these leaves, especially so in the pyloric end so as to give color to the ingesta. If this were cockle bur poisoning, why had not a fatality occurred before, as these shoats were fed in this same corn field lot for two months?

"These shoats were fed restaurant garbage the evening before, as was usual, and a check from that place claims no washing water goes into the can, and only table scraps are used. The attitude between the people of the restaurant and the owner of the shoats is very friendly.

"What, in your opinion, may have been the cause of death?"

There is much evidence of the poisoning from cockle burs in all parts of the state and country in the spring. I entered into discussion of this quite fully in the special Swine Practice number of VETERINARY MEDICINE (November, 1928), which see.

Cockle burs are poisonous to swine only at the time of germination; i.e., in the two-leaf (cotyledon) stage. This circumstance would explain why these pigs had not been poisoned earlier.

L. H. Pammel.

INTESTINAL STRANGULATION FROM SPERMATIC CORD

During the winter of 1922, I was called to attend a horse 14 miles in the country, and of course at night. I found a good big Percheron gelding three years old and weighing about 1400 pounds, suffering acute indigestion.

I proceeded to give the usual treatment and the animal made an uneventful recovery.

In July of 1927 the same owner brought the same horse to town for treatment. During the previous night, there had been a severe electric storm that had put the farmer's telephone out of order, and that morning he found this horse out in the pasture, sick, rolling around. As he could not get me on the phone, he used some home remedies without avail and then decided to lead the horse to town tied alongside of a team, arriving here about 3:00 P. M.

Symptoms: Severe abdominal pain, eyes injected, pulse full and bounding and temperature 104 deg. F. Abdomen tucked, no flatus and peristalsis absent.

Diagnosis: Abdominal obstruction. Prognosis very unfavorable.

Treatment: Purgatives and laxatives, rectal injections, etc. At about 11:00 P. M., no improvement. Gave arecolin without action. About 2:00 A. M. I told the owner we would take the patient out to the bone yard and repeat the arecolin, which we did, and in an hour the horse brightened up and by all external appearances looked like recovery. We took the horse to a nearby unused farm barn and left him for the remainder of the night.

About 7:00 A. M. we returned to the barn and found the horse uneasy, etc., but no peristalsis whatever. Gave him eserin and pilocarpin. No results and at about 3:00 P. M. we took him back to the dump ground and gave him a full dose of arecolin and in forty minutes he had passed out.

Post mortem examination: After castration the spermatic cord had retracted

back into the abdominal cavity and the severed end became firmly adhered to the pelvic flexure of the large colon. About eighteen inches of the small intestine had become thrown around the cord causing strangulation.—J. S. M., Canada.

DAIRY SURPLUS TO INCREASE

According to a report of the U. S. Department of Agriculture, the number of cows in the United States on January 1, 1930, was 22,499,000, an increase of 3% over one year ago. The number of yearling heifers increased 6% during the year and now totals 4,669,000.

SENSITIZING CATTLE TO AVIAN TUBERCULIN

It has been determined at the North Dakota Agricultural Experiment Station that swine, especially pigs from four to six weeks of age, are very susceptible to avian-tuberculosis infection. If a carcass of a generalized tuberculous hen is fed to a lot of eight pigs it is reasonable to expect six of them to become infected. The result obtained in sensitizing cattle with avian tuberculosis is equally interesting. When cattle were relatively closely confined with tuberculous poultry for a period of approximately six months or more, approximately 80 per cent of the animals would react to the tuberculin test if avian tuberculin was used, but would not react to mammalian tuberculin. When the sensitized animals were removed from further exposure they failed to react after a lapse of a few months. It was also found that sensitization could be produced by instilling into the conjunctival sac or an abrasion of the skin as small as 0.0001 and 0.00001 mg. of the pure culture. Pigeons, sparrows, and rats are reported as being potent mechanical spreaders of avian tuberculosis. Studies as to the time required to make infected poultry yards safe clearly indicates that from November to August is not sufficient time to kill all the tubercle bacilli in the soil under the conditions prevailing in the experimental lot at the Fargo station.—A. F. Schalk.

SUSPECTED POISONOUS ACTION OF HAWKWEED

Dr. W. E. Miller of Bethel, Mo., writes: "I am sending a specimen of a plant which was brought to my office for identification; being unable to find anything identical in any of the works I possess, I send it to you for identification and for information as to its poisonous effects on live stock, if any."

The specimen sent proves to be one of the species of hawkweed *Hieracium longipilum*. One of the species of hawkweed known as the rattlesnake weed *Hieracium venosum* was formerly commonly used as an antidote for bites from rattlesnakes, hence the common name. None of the plants possess any strong properties. The species all contain a milky juice and it is possible that there may be some toxic properties in this milky juice. The leaves and roots are thought to possess medical virtues, an astringent, and the juice is said to be of some value for removing warts. It is probable, therefore, that this plant may have a slight toxic action, like the rattlesnake weed. It is not likely that it is responsible for much, if any, loss of live stock.

L. H. Pammel.

Various diseased conditions of livestock result from their infestation with stomach worms, roundworms, tapeworms, flukes, and other internal parasites. These parasites cause losses that are commonly underestimated. Young animals, especially, are susceptible to serious injury. Preventive measures to be effective must destroy the parasite at some stage of its life cycle, preferably in its least resistant form. Control commonly involves systems of sanitation, use of disinfectants, the destruction or control of intermediate hosts, avoidance of overstocking, and, in some cases, the medicinal dosing of infested animals. Internal parasites are widely distributed in the United States. In general, areas of greatest danger are the low lands of warm, humid sections having large numbers of livestock. Danger from internal parasites is considerably less in the high, dry, range areas.—J. R. Mohler.

Twisting of the Gravid Uterus in the Cow

By GEORGE U. MARCHAND, Uhrichsville, Ohio

THIS is not very uncommon in the cow, although I have met with only five cases in the cow and one in the mare in twenty-five years of practice. In the cow the length of the body of the uterus and the looseness of the broad ligaments by which it is attached favor the twisting. It is as if one were to take a long sack rather loosely filled at the neck and turn over its closed end so that its twisting should occur in the neck.

The existence of torsion of the uterus is discovered generally only when the time of expulsion of the fetus has arrived, the labor pains which soon appear, are usually feeble and are separated by a comparatively long interval of quiet. Nevertheless, as time goes on, symptoms of colic are evinced now and again, and though the labor pains succeed each other more rapidly, and become more energetic, yet birth does not seem to advance. The "water bag" does not show itself, and nothing appears externally. This condition may persist six to forty-eight hours before the veterinarian is called. In other instances, the symptoms are more marked and severe during the first period. The cow appears to suffer from the pain of intense uterine and abdominal spasm, marked by violent straining, she moves about anxiously, paws energetically now and again, attempts to lie down, rests on her chest or sits like a dog on its hind quarters, springs up suddenly and often with a bound. The pulse is quickened and the expulsive efforts, though violent, are of course futile. The diagnosis of this accident, and the direction and extent of the torsion, are of great importance from an obstetrical point of view. (1) The presence of torsion. (2) The direction of torsion. (3) The degree of torsion.

1. To diagnose or recognize the existence of torsion of the uterus is not attended with much difficulty; and in describing the symptoms we have met, to a certain extent, shown the manner in which the accident of torsion manifests itself to the veterinarian.

2. Direction of torsion: The uterus may revolve on itself in two different directions, right and left.

3. The degree of torsion: To ascertain the degree of torsion is more difficult than to discover its existence or direction; though every endeavor should be made to satisfy one's self in this respect, as the "detorsion" depends on the actual condition that exists. It is evident, however, that the greater amount of torsion, so the more the vagina will be constricted, and presentation by the hand rendered difficult.

My first case was in a Jersey cow, right torsion, the other four were Holsteins, two right torsions and two left torsions.

My method of treatment that produced 100% recoveries in these five cases was rotation of the cow's body. The first step after ascertaining the existence and the direction of the torsion, is to empty the udder of its milk as completely as possible, so as to prevent the gland being injured in the operation. While this is being done, a roomy place should be gotten ready and a thick layer of straw on the floor or ground. Give the cow one ounce of chloral hydrate. Then the cow is thrown on the proper side, and with all possible care, the feet being fastened together. The hand is properly sterilized and lubricated, then introduced as far into the vagina as its condition will permit. The assistants are then to pull the ropes which secure the feet of the cow, so as

to bring the animal on its back, then gently allow the animal to roll on opposite side. This being done, the animal is raised on its chest, by the shoulder and quarter, and turned over on the side on which it was thrown. In this way it will have made one complete rotation. While the assistants are rolling the cow, the operator, with his hand in the vagina or uterus as the case may be, endeavors by pressing in the opposite direction to keep the organ fixed and to prevent its following the movemetns the body is undergoing.

If the operation is well conducted, and the body of the cow moved in the proper direction, the veterinarian will find, as rotation is carried on, that the genital passage is becoming wider and the obstacle disappearing, until the spiral rings or torsion become effaced, the hand can reach the cervix and penetrate if the os is relaxed.

If the hand is more strongly compressed by the torsion or spiral folds as the animal is turned on its axis, and the vaginal canal is diminishing in length, it is proof that rotation is being effected in the wrong direction. The remedy of course is to reverse the movement.

It is sometimes necessary to continue the turning of the cow in the same direction until desired results are obtained. (Like you would roll a barrel). Then parturition can be completed in the ordinary way by using plenty of lubrication and man power. (Some rolled four or five times before I could get my hand into the uterus). The calves were dead in all these cases, but the cows made nice recoveries.

POULTRY OUTLOOK

The number of chickens on farms in the United States was about 5 per cent greater on January 1 of this year than the year previous. The number of eggs laid per bird last year was about 3 per cent greater than in 1928. This would seem to indicate that the volume of egg production during 1930 should be at least 5 per cent greater than last year. This idea is further strengthened by the fact that a larger percentage of the poultry flocks this year is young stock of last year's raising. It would be reasonable to expect somewhat lower prices this year, and the advisability of any further expansion on the part of the industry is doubtful. —*Successful Farming.*

SWINE ABORTION AND UNDULANT FEVER

Swine have been subject to contagious abortion to an increasing degree during the last few years. The cases of undulant fever in man in this country seem to be co-existent with the increase of contagious abortion in hogs. We have the further interesting observation that the disease in man is most prevalent in the hog raising sections of the country. Iowa raises twice as many hogs as any other state and it has twice as much undulant fever. Blumer has correlated the hog population of the country with the cases of undulant fever in man with a surprising relationship. In Illinois our cases of undulant fever have not come from the orchard section of the southern part of the state nor from the intensive dairy section of the northern part of the state. They have come from the hog-raising section of the corn belt. If hogs are responsible for our undulant fever, we are mystified as to the contact with man. The best of families no longer keep the pig in the parlor. It is known that the swine strain of the abortus bacillus has an exalted virulence for all experimental animals—much more than the bovine strain of organism. If the cow becomes infected from the hog, with the hog type of organism, the milk from that cow would probably be of considerable danger to man. Many of the cultures of abortus organisms that have been isolated from human cases of the disease seem to belong to the hog variety rather than the cow variety. The hog must be looked upon, therefore, as the possible reservoir of infection of undulant fever, at least in the middle west.—Thomas G. Hull in *Illinois Health Quarterly.*

BOOK REVIEWS

In the Zoo, by W. Reid Blair, D.V.Sc., LL.D., Director and General Curator, New York Zoological Park. Published by Charles Scribner's Sons, New York. 200 pages, profusely illustrated, cloth bound, price $2.50 net.

The publisher's announcement of this work can be endorsed without reservation. It follows:

"Once an animal is in the zoo, whether born there or brought from its native home, there begins a totally new chapter in its life. This book tells how animals are cared for in the zoo, how they are fed, how they are treated when they are sick, etc., with scores of interesting and amusing anecdotes of the wild creatures. There are chapters on the babies of the zoo, on the giants of the zoo, and on the pygmies—a thrilling chapter on the King of Beasts and one on Animal Intelligence filled with unusual examples. Doctor Blair's book is based on twenty-seven years of observation and study of the animals in the New York Zoological Park. It will be of interest to all readers, young and old, who have ever visited a zoo."

Doctor Blair, who has made important contributions to veterinary literature heretofore, in this work makes an important contribution to natural history, and has enlivened a subject, dry for many, with personal anecdotes that hold the interest of the reader from beginning to the end of the book.

The New York Zoological Park was opened to the public near the end of 1899. In 1928 the visitors to the Park numbered more than two and three-quarter million people. Altogether more than 48,000,000 persons have visited the exhibits.

Some interesting information is given as to the cost of wild animals. For example, an Indian rhinoceros is worth about $8,000, and a good pair of giraffes $15,000, or about $1,500 a yard, measuring from the feet to the top of the horns. An elephant costs from $2,500 to $4,000 and a common hippopotamus about $3,000. A blue bird of paradise is worth $1,100, an ostrich $150, and peacocks $50.00 a pair. A twenty-two foot python is worth about $300. The snow leopard from the north slopes of the Himalayas is the most expensive member of the cat family and is worth about $2,000 in New York. A musk-ox is equally valuable.

Much is told of the way in which animals are procured for zoological gardens and strangely enough, the most difficult animal to capture is not the enormous elephant or the savage tiger, but the orang-utans or the red apes of Borneo, one of which is a match for any dozen unarmed men. Difficult as most of the animals are to capture and transport from jungle or desert or mountain fastness, a task requiring still more skill is that of feeding them after they have been placed in the zoo thousands of miles, perhaps from all of the food on which they subsisted in a state of nature.

The 550 mammals, 2,500 birds and 400 reptiles in the New York Zoological Park run up a food bill of $45,000 a year, and includes an amazing quantity and variety. A full grown elephane for example, will consume daily 150 to 200 pounds of hay, 35 heads of lettuce, 50 pounds of green vegetables and 15 loaves of bread. Peter the Great, the giant hippopotamus, requires six large heads of cabbage, one dozen bunches of beets, a peck of apples, 10 to 15 loaves of bread and 150 pounds of timothy hay per day.

A walrus weighing 150 pounds will eat 20 to 25 pounds of clams daily, in season and out of season. One of the heartiest eaters for its size is the duck-billed platypus, which consumes half its weight daily of small shrimps, grubs and angle worms. Feeding the giant ant eater was a problem, and it was only after much experimentation that it was found that a mixture of raw eggs, very finely chopped beef and milk made a satisfactory substitute for its natural food.

Among other things, the reptiles eat 800 large and small chickens, 200 pigeons, 1,500 English sparrows, 1,500 eggs, 300

rabbits, 3,000 rats and mice and 600 guinea pigs yearly.

The requirements of exhibition prevent the breeding of animals in the zoo on an extensive scale. Nevertheless, in its history thousands of animals have been born in the New York Zoological Park and their sale to other zoological gardens has been the source of considerable income. At one time and another all of the species in the zoo have reared young, thus refuting a popular conception that wild animals will not breed in captivity.

Some of the babies in the zoo are remarkable for their size, and the contrast with their parents in appearance. The bear cub at birth is only eight or nine inches long and weighs only about 14 ounces or about 1/500 of the mother's weight. A young fawn represents about 1/30 of the doe's weight, and a human baby about 1/20 of its mother's weight. A kangaroo at birth weighs only about 20 grains, is a trifle more than one inch long and not much thicker than a lead pencil. It bears but slight resemblance to the adult kangaroo. It is not ready to leave the pouch until six months after birth. The baby giraffe on the other hand, is of extraordinary large size, weighing about 130 pounds.

Considerable information is given concerning the size of various animals. The largest elephant of which there is any record was 11 feet 4 inches tall. Jumbo of the Barnum Circus fame measured 10 feet 9 inches. Kartoum, the Sudan elephant of the New York zoo now in his twenty-fifth year, measures 10 feet 7½ inches, and weighs four tons. It is hoped that he will be larger than Jumbo when he is full grown. He measured only 4 feet 9 inches when received at the zoo.

A male hippopotamus measures from 12 to 13 feet in length, is about 3 feet 6 inches in height and weighs 6,000 pounds. The giraffe is by far the tallest of all mammals, a full grown male measuring as high as 18 feet from the soles of his feet to the summit of his head.

The moose is the largest representative of the deer family and a full grown specimen weighs about 1,300 pounds. The bison is much larger, a full grown bull weighing 2,100 pounds.

The great brown bears of Alaska and adjacent islands standing erect on their hind legs, are 8½ to 9 feet tall and weigh 1,200 pounds.

Doctor Blair regards the stories of great age of some animals as but myths or the fabrications of nature fakirs. There is no record of an elephant having lived in captivity for more than 100 years and Doctor Blair thinks seventy to eighty years the average age of the wild elephant. The galapagos land turtle, he thinks may live to an age of 300 years, but regards 100 years as old age for a crocodile or alligator.

There are many wild specimens of the family equus in the zoo. Doctor Blair regards the Prjevalsky wild horse as being the nearest relative of the domestic horse. Their specimens were obtained from the Gobi desert and the expedition that procured them cost $25,000.

The chapter on animal intelligence is very interesting. Many occurrences in the personal experience of the author are cited to substantiate the author's belief that animal intelligence, reasoning, remembering and thinking differ from that of man in degree and not in kind.

Chapters on the care of the teeth, medical treatment of captive wild animals and surgical treatment of captive wild animals are of particular interest to veterinarians. One cannot escape the conclusion that dental ailments of animals are the result of feeding habits and foods differing from what nature intended and that the chief reliance of the zoological gardens for protection from disease lies not in medical treatment of the sick, but in strict quarantine, scrupulous sanitation and good hygiene.

In the matter of surgery, the restraint of the patient offers the greatest difficulty. Nevertheless, it has been worked out in the New York zoo to the extent that the eyes of the rhinoceros has been

successfully operated upon for the removal of cateract, teeth have been extracted from lions, a tumor removed from the foot of a big alligator and many other equally difficult operations have been performed.

Diseases Transmitted from Animals to Man

Diseases Transmitted From Animals to Man, by Thomas G. Hull, Chief Bacteriologist, Illinois Department of Public Health. Published by Charles C. Thomas, Springfield, Illinois; cloth binding; 352 pages, 29 illustrations; Price $5.50, prepaid.

Disease which may be transmitted from animals to man immediately concern several groups of workers; the veterinarian, the physician, the laboratorian and the health official. Each is engaged with a different phase of the problem however and views the subject from a different angle.

An attempt has been made in this work to present each disease against a brief historical background, emphasizing its epidemiology and means by which infection may be prevented. Sufficient bacteriology is included to balance the other material. There has been no special effort to include pathology, clinical symptoms or treatment either in man or animals, though such items have not been entirely neglected.

Although the subjects discussed in this work concern in a measure the practicing physician, Doctor Hull, for many years engaged in public health service, has made it a work primarily for the public health official. Veterinarians engaged in public health work of one kind or another, and this includes perhaps 10% of the profession, will find it a valuable compendium. Veterinarians in general practice will be interested in it only to the extent that they are interested in the history of diseases and in public health work.

That the subject of the communication of diseases from animals to man is not a new one is illustrated among other things by the following quotation from the writings of Jenner in 1796: "The deviation of man from the state in which he was placed by nature seems to have proven to him a prolific source of diseases. From the love of splendor, from the indulgences of luxury, and from his fondness for amusement, he has familiarized himself with a great number of animals, which may not originally have been intended for his associates."

One of the best things in the book in the opinion of the reviewer, is the delightful introduction by V. A. Moore, who begins his introduction by saying: "I have a keen appreciation of a book that will bring together available information on the transmission of animal diseases to man. For that reason, I willingly agreed to write an introductory preface to this carefully compiled work of Doctor Hull." Doctor Moore never misses an opportunity when addressing physicians or public health officials, to give the veterinary profession a boost and he has not neglected this one, in which he says: "The assembling of existing facts, relative to the transmission of animal diseases to the human species, will tend to emphasize the importance of competent veterinary service to every community. As the author has pointed out, the role played by animals, domesticated by man, in the spread of disease, has shown with great clearness that cooperation between physicians, veterinarians, health officers and live stock sanitarians, especially in the field of preventive medicine, will tend to minimize the dangers from animals on which the American people depend so largely for much of their food and clothing."

Perhaps the part of this work appreciated most by those not directly engaged in public health work will be the very readable history included in the discussion of each disease. This material is, of course, available elsewhere but Doctor Hull has rendered a very welcome service in collecting it from many sources and shaping it up in this work in a delightfully readable manner.

Without making an attempt to judge the value of the work to the physician or public health official, it is believed that the following excerpts from the text will indicate to veterinarians the scope and style of the work better than a description, which can at

best but indicate the opinion of a single reader.

Tuberculosis.—Egyptian mummies have shown that tuberculosis was very prevalent in the time of Rameses, thirteen centuries before Christ, and the writings of the Hindus and the Parsees 200 years earlier contain references to this disease. The Goths are said to have declared it contagious. Robert Koch in 1882 reported his findings which established beyond any doubt that the cause of tuberculosis is an organism that can be demonstrated under the microscope, cultivated in pure culture and made to reproduce the disease in healthy animals.

Although it is said that the menace to man of avian tuberculosis is perhaps comparatively slight, the literature contains a record of a score or more of deaths of people infected with that type of the organism. The first outbreak of avian tuberculosis was reported from Oregon in 1900, and for the year ending June 30, 1928, 230,000 flocks containing 21,000,000 birds were inspected in the United States. Of this number 16,000 reacted.

It might be noted here that while the title page carries the date 1930, statistics on tuberculosis eradication are given for the year 1927. The foot-and-mouth disease outbreak of January 1929 is omitted from the list and the discussion of undulant fever leads one to believe that the manuscript was prepared in 1928.

Speaking of tuberculosis of swine, the author states: "In 1908 when postmortem inspection of meat animals in its present form was inaugurated by the Federal Government, less than 4% of hogs were found infected with tuberculosis at Chicago. This figure increased until 1922 when 20.3% hogs were retained for this disease. In 1917 the eradication program in cattle was undertaken with effective results from the cattle standpoint. The best information of the time led the packers to believe that 90% to 95% of all tuberculosis in hogs was contracted from cattle. As a special encouragement to the area plan of tuberculosis eradication, the packers offered a premium of ten cents per live hundred weight on hogs marketed from the accredited area. This ten-cent premium was a great stimulus in starting work under the area plan, but when the hogs from the first accredited areas came in as many animals were retained for tuberculosis as formerly. Extensive investigations showed that three-fourths of the affected hogs were suffering from tuberculosis of the avian type instead of the bovine type."

The following interesting statement introduces the subject of pasteurization: "Pasteurization of milk was first practiced secretly by the dairy interests as an economic measure to improve the keeping quality of their product. Since otherwise filthy and unusable milk found its way to the market, health officials frowned upon the process. It was not long however, before its benefits were recognized and compulsory regulations passed for the pasteurization of all milk. Faulty equipment for many years raised some question as to the value of pasteurization, especially in regard to the tubercle bacillus. In recent years sanitary engineers have solved most of the perplexing problems and put the process upon a sound basis."

Immunization against tuberculosis is discussed.

Anthrax.—The origin of anthrax is lost in antiquity, but the epizootic with which Moses threatened Pharaoh (about 1491 B. C.) is believed to have been anthrax. Virgil described the disease accurately. In 1613, the disease carried off 60,000 people in southern Europe. It was the first disease of man and animals shown to be caused by a microorganism and the first disease against which a bacterial vaccine was found to be effective. In the spore stage, the anthrax organism has been found to survive for a period of at least 17 years, and is very resistant to chemical disinfectants, resisting a 5% solution of carbolic acid for two days, a 10% solution of mercury bichlorid for 20 minutes, a 1% solution of iodin for two hours, and boiling water two hours.

The first human case of which there is a record in the United States, occurred in Philadelphia in 1834.

The following statement concerning anthrax may be questioned: "Infections through abrasions, cuts and scratches can likewise spread the disease but such factors are of small importance in animals compared to ingestion."

About 100 cases of anthrax occur in man annually in the United States. The percentage of fatalities is falling with the extension of the use of serum in the treatment.

One hundred and forty-nine cases of anthrax among troops with 22 deaths, the result of infection from shaving brushes, occurred in the United States during the World War.

Anthrax of man in the United States is largely an occupational disease. "The present government regulations aiming to prevent the introduction of anthrax on imported hides, hair and wool apparently are inadequate to accomplish the desired purpose. The elimination of this source of contagion would greatly reduce the cases of human anthrax in this country."

Foot-and-Mouth Disease.—The historical account of foot-and-mouth disease is particularly good. It was the first demonstrated "filtrable virus" disease.

Undulant Fever.—As might be expected because of the extent to which it is engaging the attention of public health officials, veterinarians, the live stock industry and the public, much attention is given to the subject of malta fever, and contagious abortion. The author states: "The term 'undulant fever' is found in the recent literature to designate human cases infected with any of the three organisms (*Br. melitensis, Br. abortus* and *Br. abortus suis*) and is generally accepted all over the world to describe this form of infection. The government of Malta objects strongly to the term 'Malta fever'."

Apparently the author is not concerned about the objections of the government of Malta because he continues to call the disease "Malta fever" throughout the discussion, and although he points out the confusion that has resulted and continues to exist from the use of various names to indicate the organism responsible for the disease in man, goats and swine, he contributes his share to the confusion by using the terms Micrococcus melitensis, bacillus abortus, Br. melitensis, Br. abortus, Alcaligines abortus, Bacterium abortus and others with an entire impartiality.

The same criticism applies to the discussion of various other organisms, but it is not a serious one since by careful attention the reader can ascertain what is meant. However, a good opportunity was lost to impress upon the readers of medical literature the changes that have been made in recent years in the designation of not a few pathogenic organisms.

A few of the statements with regard to *Br. abortus* infection in animals may be questioned, as for example: "The animals (goats) show no morbid symptoms of the disease, however, and unless man had been infected the disease in goats would never have been suspected." Elsewhere it is stated that when the disease first appears in a flock of goats, abortion takes place in 50% to 90% of the animals infected!

Of the same disease in cattle, he says: "It has no particular clinical symptoms except those associated with the act of aborting. The health of the cow does not seem to be impaired and the death rate is nil." It is difficult to see how such errors crept into the discussion.

The infection of poultry is classed as doubtful. It is well established now. Contagious abortion in cattle is said to be the most serious disease next to tuberculosis, with which the animal industry has to deal. As a matter of fact, it is far more serious than tuberculosis.

The first recognized case of undulant fever in the United States occurred in an army nurse in 1903.

Mohler and Traum demonstrated the first human infection from bovine origin in 1911.

Under the means of prevention of undulant fever, the author has missed the point entirely. His concept of the matter is summarized in the following sentence: "The protection of the public against undulant fever is easily afforded through proper pasteurization of milk." This, of course, is incor-

rect. Undulant fever in man is largely the result of contact with infected animals and of the minor portion due to milk infection, pasteurization is not a practical means of prevention in the majority of cases. Under present conditions, pasteurization is not practical on the farm or in small towns, many say in towns of less than 10,000 population. The author suggests that where pasteurization is not practical, the milk may be boiled. Public health workers are generally agreed that this remedy would be far more harmful than the disease.

Of course, the way to protect the public from undulant fever is to eliminate the disease in cattle. In swine as well, if this should prove needful. Experience has shown that this measure of prevention, the real one, is practical and entirely aside from its public health value, is profitable.

Trembles.—Discussion of milk sickness as it is called in man, or trembles as it is called in animals, is always interesting. The chapter on this subject is no exception.

Actinomycosis.—The author gives the following under the prevention of actinomycosis: "Since most cases of actinomycosis in animals are due to accidental infections from nature, there is little that can be done to prevent them. The disease in man can often be guarded against by abstaining from chewing straws, weeds and grains."

Cow Pox.—Small pox and cow pox are discussed as the same disease and it is stated that during the eighteenth century 60 million people are estimated to have died from it. The first vaccination with cow pox lymph in America was made in 1800 by Waterhouse.

Previous to the American occupation, 40,000 deaths occurred annually from small pox in the Philippine Islands. When the American army introduced compulsory vaccination, the disease disappeared wherever vaccination was applied. In the provinces surrounding Manila, the deaths fell from 6,000 annually to not one. For the seven years prior to 1914, there was not a single death in Manila from small pox. In the United States, between 30,000 and 60,000 cases of small pox occur annually, all of them of course unnecessary.

Glanders.—Hippocrates writing about 450 B. C., mentioned glanders, and Apsyrtus recognized its contagious character and recommended segregation of infected animals. By the latter part of the eighteenth century, it was generally regarded as contagious. Babes in 1881, was the first to observe the glanders organisms in material from lesions.

Glanders is the most painful disease from which man can suffer.

Rabies.—In the thirteenth century before Christ, Aketon, son of Aristeus, is said to have died of rabies. In the fourth century B. C., Aristotle must have been intimately acquainted with it, for he wrote: "Dogs suffer from madness which puts them in a state of fury, and all animals which they bite when in this condition become also attacked with madness."

The disease is stated to know no geographic boundaries and to exist from the frigid vastnesses of the arctic to the sultry atmosphere of the tropics, and from the congested quarters of New York, Chicago, London and Paris to the sparsely settled wilds of Siberia.

As a means of control of rabies, the author lays too much stress on the value of the muzzle and too little upon vaccination. As a means of diagnosis, he minimizes the value of clinical observation and emphasizes microscopic examination of the brain. Whereas the latter is distinctly secondary in importance to the former, and has its chief use in animals in which clinical observation cannot be made. In such animals, of course, its importance is very great.

Again, he drops into the error, rather common, of referring to "when the animal returns home from his roaming." He has also heard the dude ranch story about the hydrophobia skunk and is not just sure whether it is a hoax or not. Irwin Cobb was not the first to perpetrate that joke, but when he incorporated it in a story in the *Saturday Evening Post* he certainly gave the skunk a reputation that it is going to take him a long time to live down.

The author does a good service in pointing out the uselessness of caustics and incisions at the seat of the bite as a preventive of rabies, and gives statistics to again emphasize the predominant importance of the stray dog in the spread of rabies and its perpetuation.

It is interesting at this time to know that Psittacosis is discussed.

Food Poisoning.—The chapter on food poisoning is the real disappointment in the whole book. The author strains matters too much to make it appear that animals are an important source of food poisoning in man. Of course the possibility of the transfer of the *Bacillus enteriditis* from the intestinal tract of the cow to that of man is admitted, and the further possibility of it setting up an acute food poisoning perhaps cannot be denied, but food poisoning in man, other than that due to chemical poisons and the *Clostridium botulinus,* under all ordinary circumstances, simply means that the one poisoned has been eating human feces. It is quite unnecessary to use pages and pages to beat about this indubitable fact. Food products of animal origin it is true ordinarily carry the contamination, but they convey the disease not from animals to man, but from one end of man to the other.

Trichinosis, ascariasis and taeniasis are discussed briefly.

Of less interest to the veterinarian is the discussion of diseases communicated from rodents to man, including plague, tularemia, jaundice, rat bite fever and Rocky Mountain spotted fever.

Plague.—It is stated that in the 15 centuries preceding the Christian era, there were 41 epidemics of plague. At that time it was known that rats were concerned in its spread. During the first 1500 years of the Christian era there were 109 epidemics of plague. The disease always reached western Europe by spreading along trade routes from centers in Asia. During the height of the epidemic in 542 A. D., the mortality reached 10,000 daily. In the pandemic beginning in the 11th century, 25 million people perished. Towns were left empty and all trade was at an end.

Among the human diseases spread by animals are included diphtheria, septic sore throat, scarlet fever, small pox, and tuberculosis (human type). The discussion of botulism leaves considerable to be desired from a veterinary standpoint.

Tetanus.—Under the discussion of tetanus, it is stated that the disease has been recognized since the time of Hippocrates. The natural habitat of the organism is in the intestines of herbivorous animals from which it is spread. Man likewise, may carry the organisms in his intestines without harm.

The effectiveness of tetanus antitoxin is indicated by statistics of the incidence of the disease among soldiers in the World War. During September 1914 when anti-toxin was not used, the incidence in the British army was one case in 111 wounded. In the American army antitoxin being used, the incidence was one case in 6,224 wounded, or 36 cases in the 224,089 war wounds. Before the introduction of antitoxin, mortality from tetanus was 85%. In the British Army during the World War, 2,152 soldiers developed tetanus, of which 1,011 died, or 47%. Thus so far as the treatment of tetanus in man is concerned, the question as to the value of antitoxin seems to be answered. It has reduced the mortality more than 44%.

INFECTIOUS ABORTION CONTROL

During the period of this segregation, we have noticed particularly the following:

1. Several of our heaviest producing cows were reactors.
2. Most of our udder troubles went with the aborters.
3. The bull did not contract the disease through service.
4. Calves can be safely raised from reacting cows if necessary precautions are taken.
5. That abortion elimination can be very effective in dairy herds when careful testing and sanitary methods are followed.
6. Sanitation is an important factor in contagious abortion control.—Clarence L. Cole in "How the Experiment Station Herd Was Freed of Abortion" in *Hoard's Dairyman.*

New Way to Pasteurize Milk in Homes

An easy, practicable and convenient method of pasteurizing milk in the home has been perfected in the research laboratories of the State Department of Public Health. The simple equipment necessary includes a quart thermos bottle, a pan, a thermometer and a rubber stopper. The bottle is heated with hot water while the milk is brought to a temperature of 145 deg. F. The milk is then poured into the bottle, the stopper inserted, and the bottled milk allowed to stand for an hour. At the end of that time the milk is thoroughly pasteurized and may be cooled and kept for use as desired.

This method of pasteurization is of great practical value to a large percentage of the population for whom commercially pasteurized milk is unavailable. It places within the easy reach of every housewife and mother a method of insuring for her family and especially for the children a safe milk supply.

We have found the bacteria do not multiply in the milk samples so long as the temperature is between 145 and 115 deg. F. The one-pint thermos bottle holds milk placed in it at a temperature of 145 deg. F. for 5 hours and 30 minutes before 115 deg. F. is reached. The one-quart thermos bottle performs the same function for 11 hours and 30 minutes.
The two-quart bottle 13 hours and 30 minutes.

It seems from the above mentioned results that the one-quart bottle is the most efficient vessel for home pasteurization. This bottle holds milk placed in it at 145 deg. F. for three hours before it cools to 140 deg. F. and it requires approximately 11 hours before this milk cools to 115 deg. F. Smaller vessels are less efficient, and vessels of over one quart in size are as a rule not as efficient as the one-quart bottle, and are several times as expensive.

The thermal death point of bacteria has been carried out with the use of B. typhosus, paratyphosus, diptheria, streptococcus, staphylococcus and the bacillus abortus, using cow, pig and goat strains. We have purposely used massive doses of bacteria in the milk test. Our average dose has been 5,000,000 bacteria per cc. of milk. After the bacteria have been added to the milk in an open vessel, it was placed over a gas flame and heated to 145 deg. F. During the heating, the milk was stirred with the thermometer. The thermos bottle was scrubbed well with washing powders and hot water. The clean bottle was then filled with hot water. When the milk had reached 145 deg. F., the clean thermos bottle was emptied of the warm water, and the milk poured in. Samples were removed every ten minutes, and temperature was recorded by a continuous measuring instrument. The rubber cork that was inserted in the thermos bottle was boiled in water for 5 to 10 minutes. This technical procedure has convinced us that all of the bacteria we have used are destroyed within the first thirty minutes, except certain strains of bacillus abortus obtained from the pig. Some of these strains are remarkably resistant to heat. We can say that the one-quart thermos bottle is most efficient in destroying this organism, because it retains pasteurization temperature for three hours. The longest time this organism has survived was forty minutes. In this instance, there were only ten porcine strains of bacillus abortus per cc. of milk. We have never found this or any other bacteria added to the milk to be present after forty-five minutes in the one-quart thermos bottle.

—Illinois Health Messenger.

New Chief of the Veterinary Division, Office of the Surgeon General

May 10, 1930, marks another milestone in the history of the Veterinary Corps, U. S. Army. On that date Colonel W. Geo. Turner, V. C., completes his 4-year tour of duty as Chief of the Veterinary Division, Office of the Surgeon General, being relieved by Colonel Walter Fraser, V. C.

Coincident with the completion of Colonel Turner's duty as Chief of the Veterinary Division is the completion of the first decade of the Veterinary Service as a coordinate part of the Medical Department under the provisions of the National Defense Act, as amended June 4, 1920. The first two years of this decade may be considered as the reconstruction period of the Veterinary Corps—a reconstruction of the Corps as organized during the war, based upon the needs of a properly organized veterinary service as then experienced. While these two years may be considered as the reconstructive period of the Corps from the standpoint of a reorganization of the war-time service, strictly speaking, and considered from the standpoint of the Corps being a coordinate part of the Medical Department, these two years were really the constructive period of the Corps and of the Veterinary Service as it is now organized, equipped, and functions. How well this construction was carried out is evidenced by the fact that during the following eight years there have been but few occasions when it was evident our administrative regulations were not adequate or that a change has been necessary in the plan of operation of the service.

Those in charge of the constructive period of the Corps were not able at that time to secure all they desired in the way of administrative regulations governing the Veterinary Service, and since that time efforts have been continued to secure additional regulations or changes in those in effect where it has been thought needful for the service and to keep it abreast with the changing conditions in the Army.

The last eight years of the decade now ending may well be considered as the "training" period of the Veterinary Service, as during that time, in common with other branches and services of the Army, the Medical Department service schools have functioned to capacity, and a majority of the officers of the Veterinary Corps have attended the Army Veterinary School and the Medical Field Service School.

During Colonel Turner's regime, therefore, the Corps has steadily progressed in training with a resulting increased efficiency. At the same time the "constructive" features have not been ignored, and as evidence of this fact the additions to and changes in regulations governing the Veterinary Service during the past four years are enumerated:

a. Training Regulations (T. R. 405-2040) for the Veterinary Detachment. This regulation covers the organization of veterinary detachments assigned to regiments or other field units, their functions in permanent and semipermanent camps, on the march, and in combat, drills, ceremonies, reviews, and inspections together with subjects of technical and tactical training and methods.

b. A regulation has been approved and is in effect permitting the return of animals from the Philippine Islands to the United States, subject to quarantine measures prepared by the U. S. Bureau of Animal Industry and the Veterinary Division, Office of the Surgeon General, in collaboration, and administered by the Army Veterinary Service.

This regulation does much to promote the acquisition of good show and polo horses and horsemanship in the Army, as it permits mounted officers to retain their horses during the two years tour of duty in the Islands.

c. Regulations have been changed to require a veterinary examination of every Government animal prior to inspection for condemnation, commanding officers and inspectors being fully informed of the result of the examination and advised by the veterinary officer as to what disposition in his judgment should be made of the animal.

This change in regulations had been recommended for years by the Veterinary Service, and its promulgation greatly enhances the importance of the service to the Army. The veterinary officer now has the relationship to Government animals that a medical officer has to Army personnel; he examines them upon entry into service, prior to and upon receipt whenever shipped, at stated intervals throughout the life of the animal, and finally before such animal can be condemned.

d. Regulations governing the veterinary meat and dairy hygiene service have been changed to require "whether of intrastate or interstate origin, to be acceptable all meat and meat food products purchased by the Army as part of the ration, or by organization messes, post exchanges, and post exchange or other restaurants operating within the limits of a command, must have been previously inspected and passed by the Bureau of Animal Industry and bear the stamp of that agency insofar as concerns ante and post mortem examinations, and, at times, other necessary inspection procedures."

e. Regulations governing the Veterinary Service with Remount Purchasing Boards have been changed discarding the ophthalmic method of malleining animals when purchased, and making mandatory the intradermic method, provided that sufficient time (48 hours) is available.

As a result of this change, the only method of mallein testing now authorized for use in

and recognized by the Army is the intradermic test. This is in the interest of professional progress.

f. Regulations governing veterinary dairy inspections have been changed to state that "A station or attending veterinarian *will* conduct an annual tuberculin test of all privately or publicly owned cattle within the command at least once each year. In the event that positive reactions are obtained, a retest will be conducted at intervals of six months until the herd is tuberculosis-free, after which the test will be conducted annually."

Col. Walter Fraser, V. C., U. S. Army, New Chief of the Veterinary Division.

Veterinary officers are accredited testers, and apply tuberculin tests in accordance with the recognized standards of the Department of Agriculture. Tuberculin supplied by the Veterinary Laboratory Section, the Army Medical School, only is used.

Colonel Turner has attended the annual meetings of the Remount Service of the Quartermaster Department, when animals purchased by the different Purchasing and Breeding Headquarters have been assembled at one point and a study made of animal types, purchasing and breeding methods, and related subjects pertaining to that service. It is believed that the constructive criticisms and suggestions contained in the reports made by Colonel Turner of these meetings have materially aided in the gradual improvement in the type of Army animals now being purchased and bred.

Upon relief from the office of the Surgeon General Colonel Turner will be transferred to Headquarters, 9th Corps Area, San Francisco, California, for duty as Corps Area Veterinarian. In the ordinary course of Army events Colonel Turner's new station will probably be his last one, as he will reach the statutory age for compulsory retirement December 16, 1934.

Colonel Walter Fraser, V. C., has been ordered to duty in the Office of the Surgeon General to replace Colonel Turner as Chief of the Veterinary Division. Colonel Fraser was born in Iowa, June 16, 1872. Graduated from the Chicago Veterinary College in 1900, and on January 29, 1903, was appointed Veterinarian in the United States Army, from Utah. He was assigned to the 13th Cavalry, and served with that regiment until 1916, 13 years. During this time he served two 2-year tours of duty in the Philippine Islands, returning to Fort Myer, Virginia, after the first tour and to Fort Riley, Kansas, after the second tour. In 1906 Colonel Fraser was detached from his regiment (while at Fort Myer, Va.) and ordered to the University of Liverpool, England, for a special course in tropical diseases. In 1912 his regiment was ordered from Fort Riley, Kansas, to the Mexican Border, being on duty at Columbus, New Mexico, at the time of Villa's raid, and entering Mexico. In 1916 the regiment was returned to Fort Riley where it was converted into Artillery regiments, and Colonel Fraser ordered to Kansas City for duty on a horse purchasing board. After three months he was relieved from this assignment and ordered to Camp Custer, Michigan, to organize the Veterinary Service at the Remount Depot. Upon the organization of the 85th Division at Camp Custer, Colonel Fraser was assigned as Division Veterinarian, accompanying the Division to France. Colonel Fraser's duties in the A. E. F. also included service as Veterinary Representative at General Headquarters, Chief Veterinarian of the Advanced Section, and later duty on the Rhine. He was made a member of the "Black Star" (an old order during the Napoleonic period) by the French Government. Upon returning from France Colonel Fraser was ordered to Fort Sill, Oklahoma, for duty with the Field Artillery School. He graduated from the Army Veterinary School in 1921. Subsequently he has served at the Fifth, Second, and Ninth Corps Area Headquarters, a three-year tour as Department Veterinarian, Hawaiian Islands, then to the First Corps Area Headquarters, where he was serving when ordered to his new duties as Chief of the Veterinary Division. Colonel Fraser was elected one of the Vice-Presidents of the American Veterinary Medical Association in 1926.

Colonel Fraser is the seventh officer to be appointed as Chief of the Veterinary Division, Lieut. Colonels Griffin and Marshall, V. C., and Miller and Morse, M. C., during the war and for the first two years of the past decade, and Lieut. Colonel McKinnon, V. C., and Colonel Turner, V. C., during the past eight years. Colonel Fraser's length of service and experience prior to, during, and since the war particularly equips him for the duties of his new assignment. (G. H. K.)